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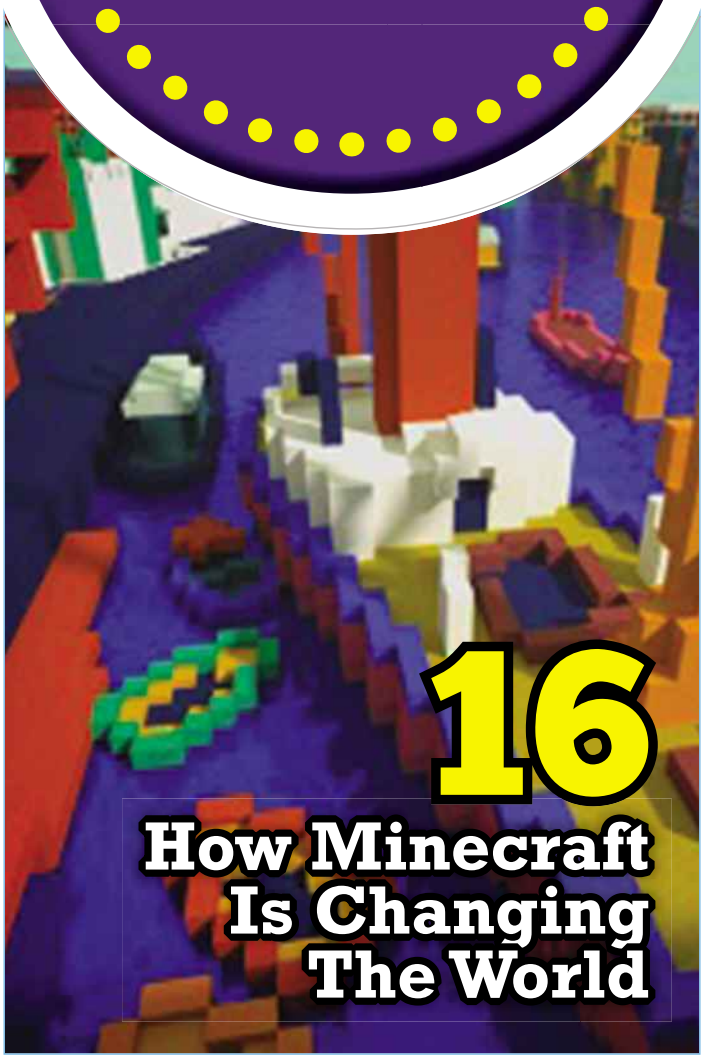

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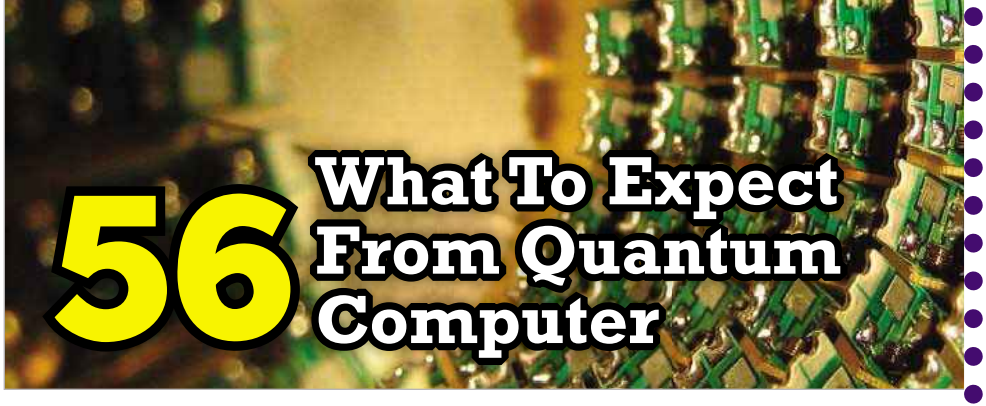

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58 Why Won't The Pirate Bay Die?

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Is Openreach Beyond Reach?

Mark Pickavance looks at Openreach and if breaking it and BT up is the whole answer to getting better UK internet

For those not old enough to remember 'A' and 'B' dialling phone boxes, at one time in the UK there was only one company when it came to phones and it was wholly government owed.

Technically, BT was part of the post office, and it delivered whatever service it liked at the prices it decided, because this was a monopoly and no competition existed.

Therefore, with the exception of businesses, relatively few people had phones in their homes when I was growing up in the 1960s, because they cost lots to have and use.

Meanwhile in the USA, the breakup of Bell into the 'Baby Bells' suddenly meant calling was cheap and often free. At the time, I wondered why UK customers couldn't experience these service levels, and after a very long time eventually they did.

In 1982, British Telecommunications was floated off from the Post Office, and that new 'BT' was subsequently divided into four parts: BT Global Services, BT Business, BT Consumer and Openreach.

The really critical part of this new business model was Openreach, because it controls the critical communications infrastructure from the homes and businesses to the local exchange and between there and BT Wholesale/Local Loop Unbundling (LLU) termination points located in the exchange.

By definition, unless you connect to the internet using a mobile service or directly using a fibre service provided by Virgin, at some point in the chain your connection becomes the responsibility of Openreach, even if you don't have a commercial agreement with it or even BT. Which is strange. And it gets odder when you have a problem, because this is a business that you can't easily ring up and complain to.

Unreachable Openreach

If you've ever had a phone or internet connection problem, then you might ring your supplier, and they might tell you that's an 'Openreach' issue. Right, you say, put me through to them so I can get this sorted out!

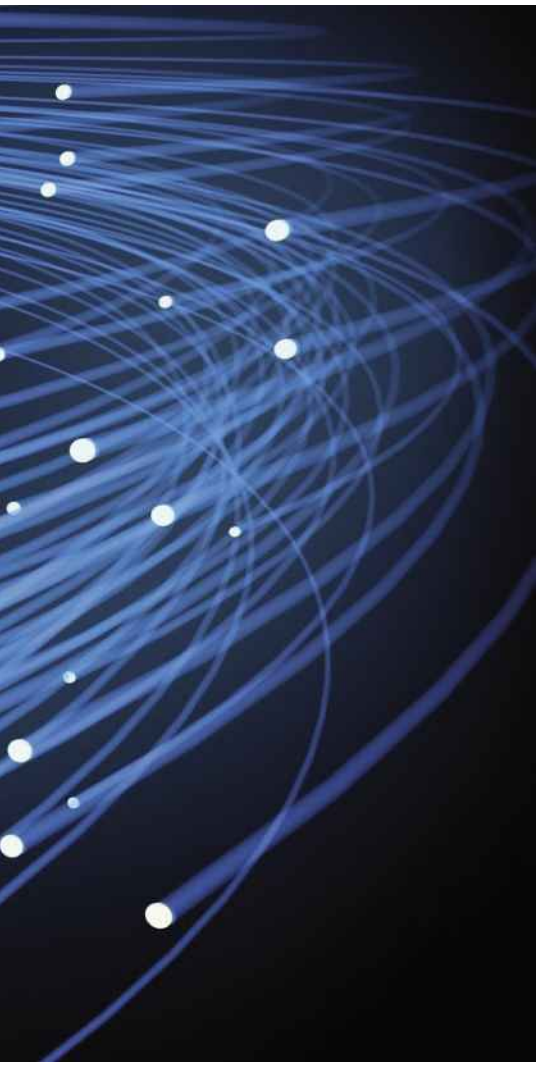
At that point, the conversation will go precisely nowhere, because Openreach refuses to have any form of direct customer contact experience. It only deals with the service providers, the likes of BT, TalkTalk and Sky Broadband, among many others.

The scope of this power is that 70% of UK broadband customers are using BT services through Openreach for their internet service, regardless of who they're contracted with.

The silliest complaint conversations regarding Openreach usually take place with BT customers, because as compelling as the phrase 'but you are the SAME company' is, it will get you absolutely nowhere.

The ISP will pass on the problem to Openreach, and if it's not busy, or having as siesta, then it will see about fixing it But where things get really difficult is that who your ISP is could influence how long it takes to fix, and astonishingly BT customers get a better service, it seems.

That annoys customers, and it upsets those providing ISP services who aren't BT,



openreach
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who feel quite rightly that they deserve the same service.

That's a major complaint from those competing businesses, because delays in fixing or installing new services reflect on them, but this isn't their only problem. The small matter of 'Dark Fibre' and who controls access to it is also a major bugbear.

Darkest Fibre

The expression 'Dark Fibre' seems to imply some magical coloured glass strands that carry more data than the usual clear ones, but that's not the case.

When a fibre network is being physically run between two locations, the cables are generally much thinner than the copper ones that previously connected the same paths. So if the copper is removed (valuable copper), you can usually put a lot more fibre down there than would be normally needed for the data required to run along that route.

For communications engineers there is a cost advantage in oversubscribing the fibre they put in place, because compared with digging up roads or pulling cables through, the actual cable is relatively inexpensive.

So instead of putting enough for the job, they put lots more fibre underground, and they wire it up in the exchanges, but unallocated in the system. Therefore it remains 'dark' and unbothered by quarrelsome data until the company wants to use it to expand its services.

What's frustrating is that if a ISP reseller, like Sky Broadband, for example, is having customers complain that their service is slow, they know full well that BT has unused 'dark fibre' channels that could help them improve that.

> **"Openreach refuses to have any form of direct customer contact experience"**

Logically, therefore, you'd think that Sky might consider running its own fibre, because there's a nice duct between these two locations that BT created to run its copper/fibre, and they're usually not anywhere near full. However, BT won't allow Sky or anyone else in its ducts, in case they damage BT cables or fill space that it would like to use later.

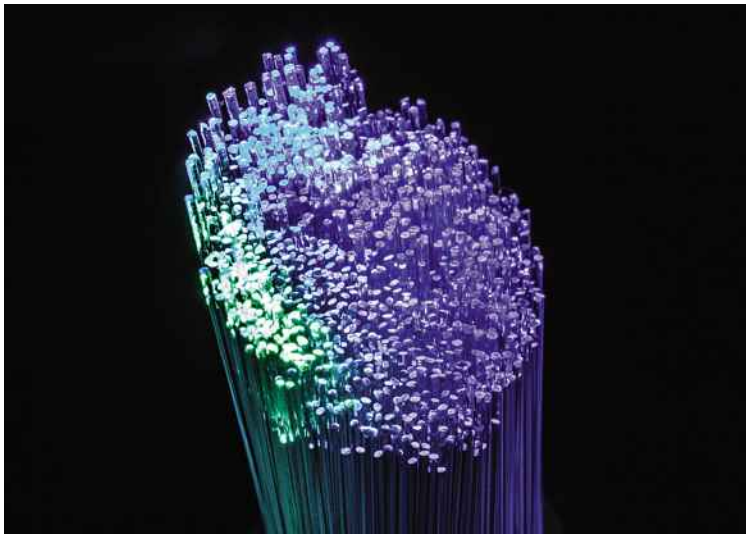
This row has gone on for some time, especially after OfCom raised the scary possibility in March of this year that itr would force BT (and Virgin also) to allow UK wholesale customers access to unused fibre paths and also available ducts.

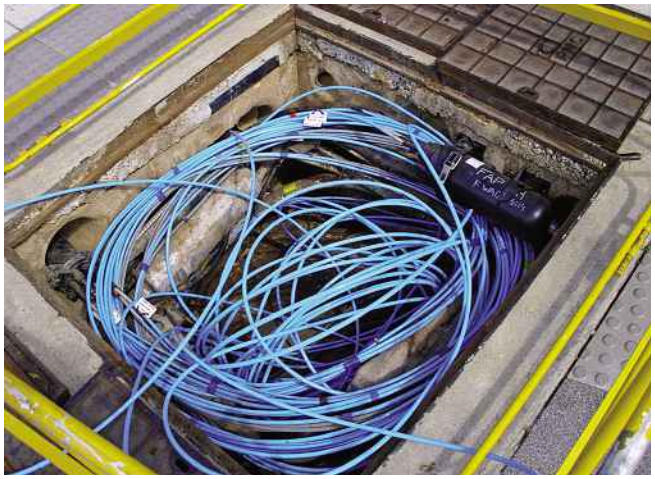
The BT reaction was predictable, and along with Virgin and KCom, it reportedly wrote a letter to OfCom warning that doing so might cause "significant regulatory uncertainty, undermining the return on sunk investments and therefore disincentivising future infrastructure investments".

To paraphrase that for non-speakers of classical corporate talk, it warned that if it wasn't allowed to use 'dark fibre' as a weapon to beat it competitors with, then it might not play at all.

It also threw in a line about letting other children play on its train set: "allowing multiple operators to tamper with the physical network will cause service faults for customers".

The big stick of curtailing investment is one that BT likes to wave now and again, forgetting that if it spent less and it was a more open market, then the smaller companies would be inclined to spend





Running fibre underground is what Openreach does, and BT doesn't want it doing it for anyone else

more to improve their market share in proportion.

But those without infrastructure are also trying to release the vice-like grip that those with it have on their bandwidth, and indirectly their customer service levels.

Complaints, They've Had A Few

If BT, Virgin and KCom are in one camp, then in the other are service resellers like Sky Broadband and TalkTalk. They've been pressing their case to have Openreach taken away from BT, saying it damages competition and also penalises the customers with higher than necessary pricing.

In an interview that TalkTalk's chief executive, Dido Hardin, did with the Guardian, she reiterated that Ofcom should use the review to end the conflict of interest that deterred Openreach from meeting its obligations to BT's competitors.

And to the same publication, Jeremy Darroch, Sky's CEO called for what many in the industry see as imperative: the BT and Openreach breakup.

"Structural separation of Openreach, the UK's only nationwide broadband infrastructure, is at the heart of creating an industry that provides the capacity and incentive to invest whilst also harnessing the power of multiple competing retailers to drive higher take-up and lower prices for customers," he said.

And Sky Broadband went even further than just interviews, creating a detailed submission to Ofcom regarding "the limited scope for competitors to BT to deliver superfast broadband services via their own infrastructure" and complaining about how poor levels of service that Openreach provides are damaging Sky's reputation with its customers.

> **"It's a short but effective vertical market, where Openreach can develop the infrastructure so it best advantages BT, which potentially damaging its competitors into the bargain"**

The key points made by this submission centre around how the normal market forces for Openreach just don't apply, because as its group operation is the dominant retail provider there isn't any incentive for it making any of the competing businesses any more competitive.

It also provided extensive statistics on how long it takes Openreach to connect its customers versus those of BT, with 420,000 Sky customers experiencing delays of greater than ten days in the past year.

This is something Openreach has been dragged over the coals for before, because in November last year BBC's consumer show *Watchdog* flayed it for outrageous delays.

In one instance a customer in central London was told that they'd have to wait seven months to be connected, within weeks of Ofcom's announced intention to impose new service agreements on Openreach.

These rules came into force on July 1st 2015 and require Openreach to rectify 70% of faults (rising to 80% by 2016) within two working days, achieve new installations that require an engineering visit within 12 days for more than half the customers, and report publicly on how it's doing. Failure to achieve these standards across the board (i.e. not just for BT customers) could have serious consequences for Openreach, though exactly what OfCom will do hasn't been spelt out.

At this time OfCom isn't committing to either snap Openreach off BT or open up dark fibre to competitors. Instead it's doing what it does best, carrying out an "overarching review of the communications market", and it's promised to provide an update of the progress this summer.

Final Thoughts

The thrust of BT's position is that separating BT and Openreach might have unforeseen circumstances, and in that respect it would be better to maintain the status quo.

However BT presents this as being the best scenario for everyone, being able to control both much of backbone infrastructure, local loop and the strongest retail service is a winning combination. It's a short but effective vertical market, where Openreach

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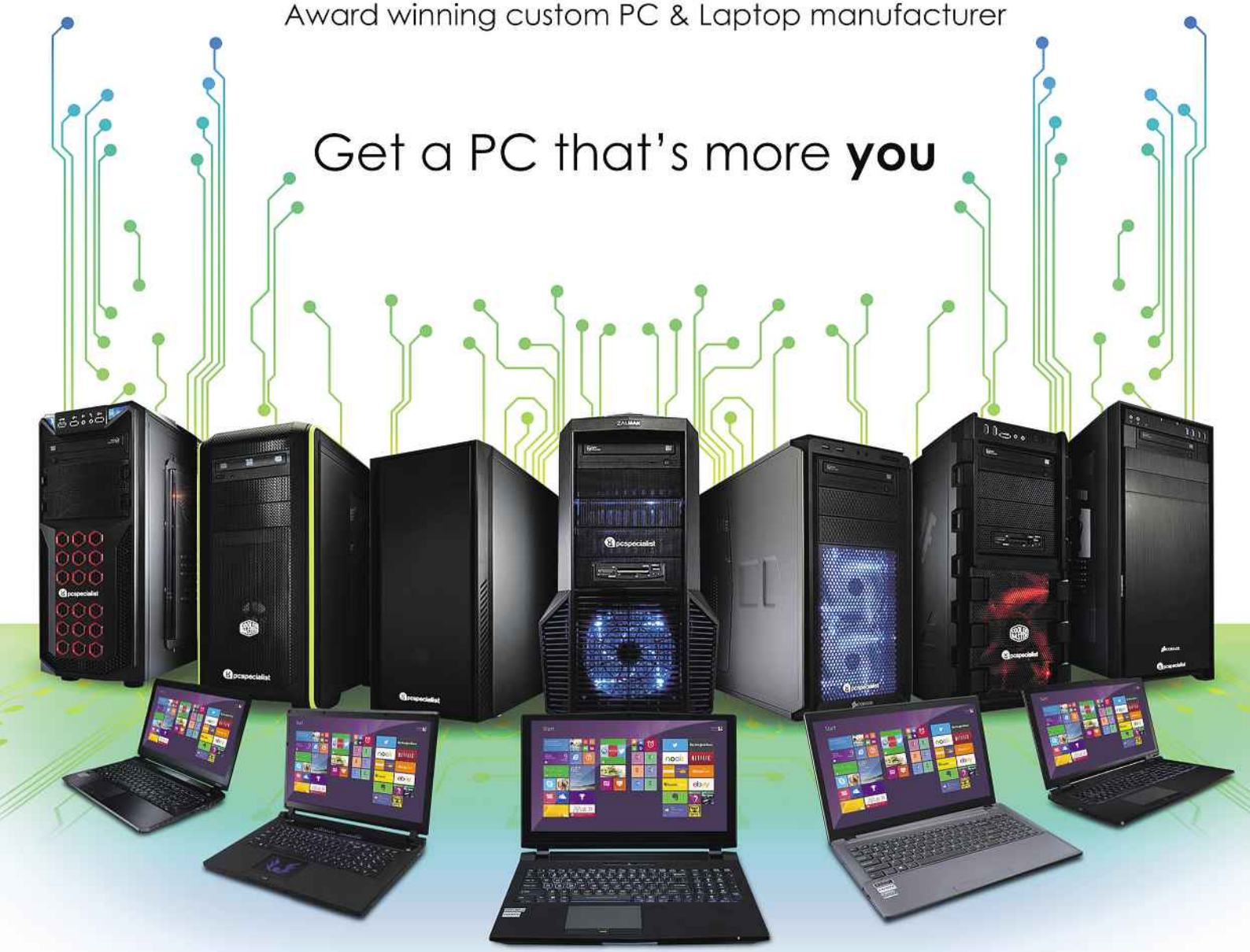

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Jeremy Darroch is the senior executive at Sky Broadband and wants to see Openreach and BT sent to different corners

BBC's Watchdog wasn't impressed with Openreach, a company that employs more than 25,000 engineers but seemingly refuses to talk to customers

can develop the infrastructure where it best advantages BT, while also potentially damaging its competitors into the bargain.

If you want to put this in another perspective, currently Network Rail controls the railways infrastructure, and numerous commercial service providers run its stock and carry passengers on its rails. Imagine if Network Rail was also a rail carrier, competing with Virgin and their like on the same pieces of local branch track? Track that it might schedule repairs on at times when other providers' trains run or at prices that aren't the same as it charges itself?

On that basis, few companies would come forward to run a service, because they're not competing on a level playing field.

No wonder the companies trying to sell broadband in this country are complaining, because from a commercial perspective this game is almost certainly rigged against them. If it wasn't, then BT wouldn't be desperately trying to stop Openreach being cut loose.

What ISPs would really like would be access to the dark fibre network and the conduits that Openreach keeps exclusively for BT use, and it's no longer acceptable that it's withholding that facility.

This is as important as getting BT and Openreach apart, because they've become a roadblock to many wanting faster service, better customer responses and more cost effective internet access.

But the question is whether Ofcom will actually do anything about this or if, as it's done repeatedly in the past, it will kick it into the long grass.

It's the opinion of this writer that as a regulator Ofcom's track record is at best woeful, and at times it has been abysmal. It's meant to help customers, yet 33 years after BT was split from the Post Office, it's still an effective monopoly in many parts of the country, with the lion's share of all business.

While Openreach is theoretically 'ring fenced', it's still a wholly owned subsidiary of British Telecommunications plc, and it's board members report to the BT chief executive. Prior to 2005 it wasn't even that segmented, and it only changed because Ofcom and BT did a cosy deal that changed little in commercial terms, but gave both sides plausible deniability.

After the debacle where the government offered hundreds of millions of support grants to get rural areas better connected to the internet and BT ended up with all the money, those running Ofcom should have resigned, but didn't.

What we have now is a situation where when a customer complains, BT hides behind the 'that's an Openreach problem, so we can't help you' line. And when financial results are in, oddly Openreach is a major contributor to the bottom line of BT.

So far for the first six months of 2015, that's to the tune of £1.25bn, representing 29% of BT's total revenue for that period.

It's about time that OfCom actually started to live up to its mandate, stopped taking the guff that BT hands out and split Openreach from the rest of BT, once and for all. And then it should allow either another company to complete with Openreach or let ISPs have access to fibre, poles and trunking. As it is, the continuing situation has been great for maintaining BT's market share but highly detrimental to all the other stakeholders in the UK.

If OfCom refuses to deliver this to UK customers and independent ISPs, then perhaps it needs replacing with another organisation with enough steel to do its job properly. **mm**

EE And BT

If the trouble over Openreach wasn't enough, BT recently signalled its intention to go back into mobile services by merging with mobile network EE. This £12.5bn deal was greeted by many of the other mobile providers demanding that the Competition and Market Authorities reject the merger on the basis of reduced competition that wouldn't be in the UK consumer's interest.

With its previous move into TV with its new sport services (and EPSN UK), BT is determined to make a multi-pronged attack on the media sector in both distribution and content.

Should the EE merger go ahead, it will boost BT's share of the mobile market from 31% to 34%, edging closer to the 40% that would automatically trigger the regulator to intervene. In terms of revenue, not customers, it would hit that magic 40% level with EE.

As if to underline EE's suitability to be part of BT, it's just been fined £1m for failing to provide its customers with the full complaint resolution information that its obliged to. It also misinformed customers in regards to 'deadlock' letters and failed to include in its customer complaints code any reference to this potential avenue.

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Six Ways Minecraft Is Changing The World

'More than just a game' may be a cliche, but in the case of Minecraft it's probably true, as David Crookes found out

A one of the globe's most successful gaming franchises, *Minecraft* has been downloaded more than 60 million times. It has become so popular, that videos on YouTube which discuss the game attracted an estimated 4.1 billion views in May of this year alone. It is a flexible entity allowing those who play it to unleash their creativity, but there is no way that Marcus Persson could have known what he was unleashing when he first began to code it one weekend back in 2009.

For what started off as a mere game – albeit one without levels, points or a story, set in a vast, free virtual world – has become so much more. Its use has developed into something very relevant in real life and it has been adopted as a tool to achieve so many different ends. On July 4th and 5th, thousands of people turned up at London's ExCeL for MineCon in order to find out more about the game's diverse nature – and over the next few pages, we'll take a look at some of the exciting ways *Minecraft* has come to be used.

Minecraft As Art

Running until the end of August, the exhibition Tate Worlds bills itself as "Art Reimagined for Minecraft". It takes traditional and famous paintings and recreates them within the game, combining art, history and adventure in the process. There are currently eight Minecraft art worlds, each inspired by artwork or a painting.

The Pool of London, for example, lets visitors explore England's capital along the Thames just as painter André Derain did in 1906. *The Toy Shop* let players explore a world inspired by the Peter Blake artwork of the same name. The digital re-imaginations allow for multiple player interactions, and are all available to download at **tate.org.uk**.

Producer Tony Guillan who turned the train tracks in Christopher Nevinson's *Soul of the Soulless City* into a playable *Minecraft* roller-coaster ride around New York. Tells us more.

Micro Mart: Why use *Minecraft* in this way – what does *Minecraft* bring that traditional methods of exploring art do not?
Tony Guillan: *Minecraft* is hugely popular with millions of children and young people all around the world. One of our missions as a team is to engage new audiences with our wonderful collection of art – so if you're looking for a place where young people spend lots of time being creative, *Minecraft* is a very good place to investigate. When thinking about our mission of 'telling the story of art', *Minecraft* offers a really innovative way to explore the stories, ideas or themes behind individual artworks in a way that is genuinely fun and interesting to young people.

MM: How can help *Minecraft* bring art to life?
TG: We're trying to make young people more aware of works of art but we can't just parachute information into what is a very exciting gaming platform. We realised we had to go with the conventions of the platform – and *Minecraft* worlds have many typical elements when it comes to what people expect from games. Young people play 'adventure maps' because they are exciting and playful, so in interpreting the themes of artworks, we had to come up with genuinely exciting activities that explored these themes in a not too formal way.

Take our map inspired by Andre Derain's painting *The Pool of London* (1906) – what did we want young people to find out about this, other than it is a painting of London along the river Thames? Well, it's a 'fauvist' painting, and fauvist artists were primarily concerned with using bold colours, so we decided to focus on the colours used in the painting and created an adventure round London where players search for the 'pigments' used to create these colours.

MM: What has the reaction been from visitors?
TG: The response to Tate Worlds has so far been really exciting, with thousands of *Minecraft* users from different parts of the world downloading the maps. It's also been encouraging to receive feedback from closer to home, with several parents contacting us to say how much their children have enjoyed playing the maps, stimulating an interest in the artworks. For this reason, we plan to create ways that young people can 'find out more' about each artwork online. Artworks are there to be enjoyed and are not just visual encapsulations of facts.

Our map inspired by Christopher Nevinson's painting of New York – using a little creative license, we turned the train tracks in the painting into a roller-coaster ride (a common feature in *Minecraft* referred to as minecarts) around New York where you pass through a fast paced city. We hope that the dynamism of our game reflects the New York that inspired the painting, giving players a more instinctual understanding of the artwork. Hopefully players will take away an appreciation of artworks in terms of the stories they tell, or how they express feelings or experiences that they too can then investigate. By making the activities fun, we hope to inspire young people to want to find out more.

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Saving Children

In July last year, the charity Save the Children launched a fundraising initiative that encouraged people to create virtual medical centres in *Minecraft* and gain sponsorship for doing so. The project, dubbed Clinic Craft, aimed to use that sponsorship money to build six new real world clinics in Liberia, a country where roadside births are common because pregnant women often have to walk for hours for medical attention.

To encourage people to take part and download a clinic blueprint to start work on, the campaign ran on the lines of a competition – and, as such, offered a range of toys, mugs, t-shirts and much more as prizes to those who took the time and effort to take part. It was so successful as a fundraising and awareness campaign that it took prize in the Internet Advertising Bureau Creative Showcase Awards, and it earned a big pat on the back for videogame personality Dan Maher and Minecrafter Chris Doney who had come up with the innovative idea.

Helping Children With Autism

Journalist Keith Stuart has long praised *Minecraft* for its ability to give his son a voice. That's because the *Guardian* writer's six-year-old son has autism, which means he has fallen behind in his language development and become socially awkward and withdrawn. *Minecraft*, though, has helped him to develop. "It was like a light switching on," he wrote in an article on a subject. "He just got it."

Indeed, *Minecraft* has been helping scores of children with autism. Much of that is thanks to Stuart Duncan whose son has an autism spectrum disorder known as PDD-NOS (pervasive developmental disorder not otherwise specified). He set up a *Minecraft* server called Autcraft that only allows children with autism to join. More than 5,000 are enrolled and it become a major success.

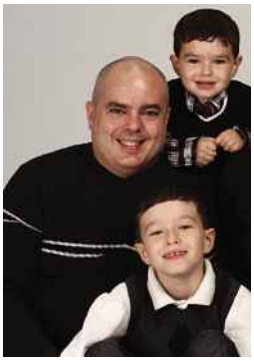
"I have been writing about autism both on my blog and for various organisations for almost five years now," he says. "I noticed more and more parents taking to social media in order to find other parents that have *Minecraft*-addicted children that they can pair up their children with. As it turned out, because their children have autism, they were being bullied on virtually every *Minecraft* server they tried to play on. People killed them repeatedly, stole from them, destroyed their builds and worst of all, said the most cruel things imaginable."

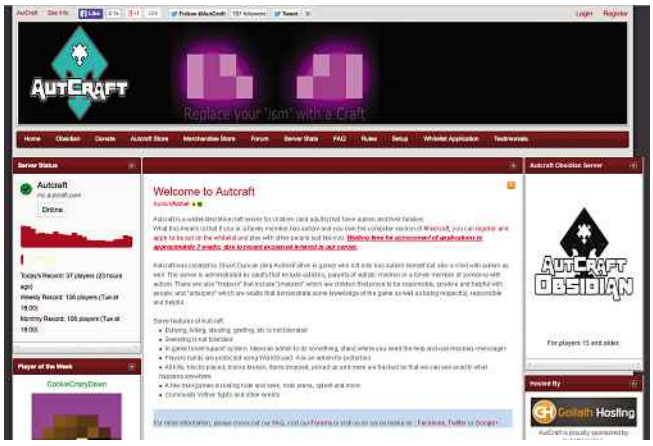
This was a major problem, denting the confidence of children who desperately wanted to play. With their parents feeling helpless, Mr Duncan decided to step in. "I set up a server where my children and their children could all play together where bullies couldn't get in, and if they did find a way in, would be removed quickly," he continues. "I made it a whitelist system where you have to apply and picked other autism parents and adults with autism to help me manage the server."

Word spread like crazy. In just two days, he received more than 750 emails. "Since then, we've heard from many parents who say that their children are reading and writing better, they're talking for the first time ever, they're making friends for the first time ever and they generally have much more self confidence."

Autcraft encourages players to help each other and to share resources, build together and support each other as they play. The aim is that no player one ever tease another – or tries to make someone else feel bad. Mr Duncan adds that Autcraft protects "all of the player's properties so that no one can do any damage and we log everything on the server including who places what where and who breaks things too. Those that are willing to be friends to other players that are lonely or needing a friend are given the rank of Buddy, which grants them special permissions to do things like heal and feed each other with just a command. Those who do even more and are truly helpful to one and all are given a Helper rank which grants them even more permissions such as teleporting or even muting those that might be causing a disturbance in chat."

There is no doubting the high regard Mr Duncan has for *Minecraft* and the difference it has made to his child and others. "*Minecraft* is a very valuable learning tool for just about any child, but it lends itself well to children with autism because there are no limitations. There is no storyline that you must stick to, no levelling up or getting stronger, no bosses to beat to get to the next level. You just play how ever you want to play. You can build, explore, fight and you can make castles or starships or recreate Rome if you want. This means that no one can ever tell you that you're doing it wrong or that you have to stop obsessing over that one thing that you want to spend all your time doing. You're free to do just about anything you want."





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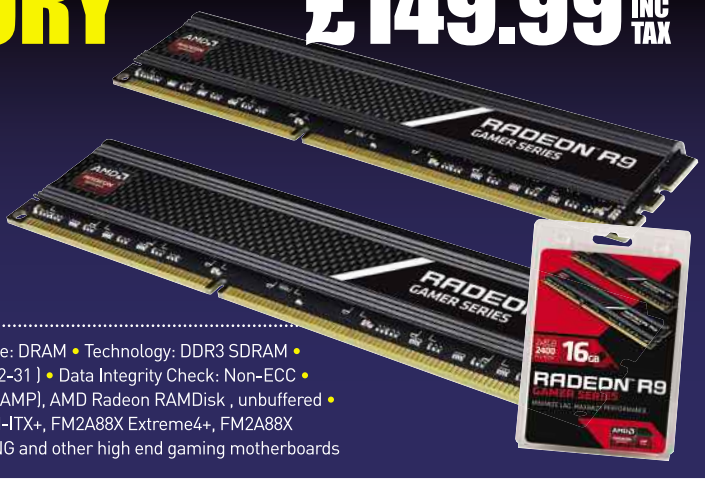

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Teaching The World

Many teachers have integrated *Minecraft* into lessons, having come to understand the flexibility and lure of the game. Science teachers have used it to produce 3D models of cells and art teachers have explored pixel art. History teachers have recreated ancient worlds too.

Much of this is due to TeacherGaming, an America-based organisation that's created a school-ready version of *Minecraft* called *MinecraftEdu*. Accompanying it is a library that lets teachers select worlds best suited to arts, English, foreign languages, health, maths, science, social studies and technology for all sorts of age groups. There are adventure, exploration, mission-based, observation, puzzle and story packs.

Micro Mart: Why use *Minecraft* in this way – what does *Minecraft* bring that traditional methods of teaching do not?
TeacherGaming co-founder Joel Levin: *Minecraft* gives teachers a powerful tool to use in the classroom. Kids are crazy about the game, instantly engaged and eager to participate in the lesson. Once they are in the game world, there is no limit to the types of experiences they can have. Anything from collaborative building, to roleplaying, to simulations. One of *Minecraft*'s keys to success has been its flexibility to be customised. With *MinecraftEdu* we've taken advantage of that to add features that teachers and students would find useful.

MM: Where did the idea come from?
JL: As an educator, I've always looked for games to bring into my classroom, but most traditional learning games fell short of my expectations. They just weren't very fun!

It always made more sense to me to find games designed as entertainment that also offered an enriching experiences. When *Minecraft* came along I realised that I could shape the core game experience to fit my lessons and curriculum perfectly. It was very shortly thereafter that I realised, with a bit more tweaking, *Minecraft* could be shaped into a platform that let ANY teacher build experiences for their needs. Thus *MinecraftEdu* was born.

MM: To what extent can *Minecraft* be used in teaching?
JL: *Minecraft* is being used in virtually all subject areas, across all age groups from kindergarten to university. That's not an exaggeration. Science teachers have asked students to design experiments, technology teachers have taught students to write code using mods that add programmable computers to the game world, and elementary teachers have had students explore types of communities and governments through play.

Perhaps the most effective experiences come when teachers get out of the way and letting the students play organically. This types of experience can lead to amazing conversations about digital citizenship, online identity and responsibility.

MM: And what has the reaction been from pupils?
JL: Overwhelmingly positive. I don't think it's simply because they are getting to play they're favourite game. Bringing games into the classroom adds a relevancy to school. The current generation of kids spends an incredible amount of time consuming games as a medium. And that has lead to sophisticated literacies that are often overlooked by the adults in their lives. Allowing them to bring these skills and passions into their classrooms can be a such a powerful and validating experience for kids.

Mapping The World

Those who have used *Minecraft* for mapping have been very ambitious indeed. Take the Danish government, which comissioned the recreation of 16,062 square miles of Denmark, or our own Ordnance Survey, which used 83 billion virtual blocks to represent a whopping 85,000 square miles of the UK.

Such is the flexibility of *Minecraft*, though, that it also lends itself to geology, which is where the British Geological Survey (BGS) comes in.

"One of the key roles of the British Geological Survey is to make our data more accessible and understandable to the general public, so by using a gaming platform like *Minecraft* we are able to raise the profile of who we are and what we do to a whole new audience," says Steve Richardson, geospatial applications developer at the BGS. "The game is familiar, understandable and intuitive, so players can get straight in and exploring the world we created rather than having to learn how to use the software in the first place."

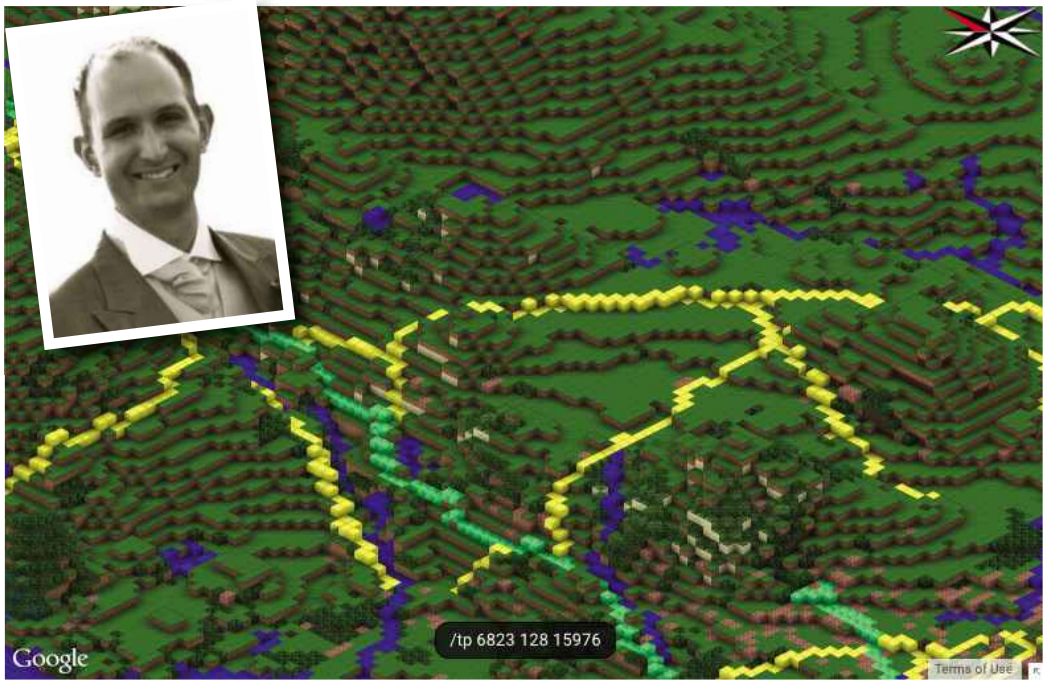
By incorporating 'real world' geology into *Minecraft*, users can engage with geology, ask questions and learn more about where and why it varies across the country. For example, in its *Minecraft* world the Isle of Skye is full of Obsidian blocks, which represents the large amounts of basalt from past volcanic activity.

It helps that *Minecraft* is three-dimensional since geological maps are two-dimensional representations of three-dimensional 'real-world' concepts. "Geological maps are technical paper documents that require an understanding and level of geological knowledge which most people do not have," says Mr Richardson. "When you look at a geological map of the UK you can see how the geology is laid out when looking from above, after you've stripped away surface features like forests, buildings or roads, but it takes a deeper understanding of geological processes and concepts to re-interpret in your mind how the different layers of rock join, fold, overlap, fault or dissect each other."

By using three dimensional models and allowing people to see the geology from all angles Mr Richardson says it lets you visualise and start to understand what it really going on beneath the surface. "*Minecraft* is a fantastic tool because you don't need to do any mental calculations – the rocks are right there and you are able to dig through them, mine out areas and explore the geology 'first-hand'. Anyone with access to the game can learn about the rocks beneath their feet in an intuitive and immediately apparent way."

That said, the map the BGS has released is not a 'true' 3D representation of the geology across Great Britain – "we have not included the 'layers of the cake'" – but instead shows the soil parent material classification. "This is why we are excited to be working on 3D models, which show how the different layers sit in 'real life', to really extend and enhance the way that we can visualise the fascinating geology of the UK."

The BGS is working with an educational group called GeoCraft which is directly involved in using *Minecraft* within schools for teaching children about a wide variety of environmental issues. "We are currently developing a system to incorporating more accurate geological models showing the different layers of geology into their *Minecraft* worlds, to make their scenarios take into account what is below the ground as well as above it."



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Making Historical Maps

Minecraft is brilliant for gaining a glimpse into the past. The New York Public Library has transformed an 1860 map of Fort Washington – a fortified position at the north end of Manhattan – into a 3D *Minecraft* world. Developer Paul Beaudoin and colleague Leonard Richardson talk to us.

Micro Mart: What was your intention with this project?
Paul Beaudoin: The idea to generate *Minecraft* maps from our own historical maps had been kicked around at NYPL for a while – particularly following the Ordnance Survey's stunning work to generate a map of the entire UK from contemporary data. When an opportunity came up last year to work on an open project, our colleague Sean Redmond added 'historical maps in *Minecraft*' to the roster of suggested projects. Sean ended up working on something else. I registered interest in the historical *Minecraft* idea and was very fortunate that Leonard also showed interest.

MM: How does the process work?
PB: We produce high-res scans of our historical documents as a first step, but I think it can also be important to make an initial effort at information extraction – to move beyond the bitmap and identify the essential data points the document represents. Digitisation of scanned text documents may include text extraction, for example. In maps, there are several things you might want to extract: political boundaries, buildings, text, and so on. The information inside the Fort Washington map includes buildings, bodies of water, pathways, and elevation – all of which map readily to *Minecraft*. I wanted to represent that information in *Minecraft* so that I could walk around in it for myself – an especially appealing prospect considering the area of Manhattan depicted in the map is now mostly buried under brick and concrete.

MM: Leonard, what was your reaction to the approach and the use of an historical map in particular?
Leonard Richardson: A historical map is one of the most interesting things you can put into *Minecraft* because it shows you a place that doesn't exist anymore. And because Minecraft is lo-fi there's no expectation that everything be smooth and a perfect representation of reality. The *Minecraft* world cuts off at the edges because that's where the map cuts off. A contour map is already blocky in one dimension (height), so even if you made a perfect 3D representation of the map, it would still look a bit like a *Minecraft* world.

MM: What can people who visit the map learn from it?
PB: *Minecraft* is famously blocky but the game can produce surprisingly immersive worlds in spite of itself. Our minds somehow convert this impossible, jagged environment into something cohesive and intuitively navigable. So I think a *Minecraft* rendering of an historical topo[graphic] map promises that at least: A lo-fi way to inhabit a space that no longer exists. Also, the particular map we chose contains a number of human-made structures, roads, and bodies of water, which are best understood with reference to the local elevation. Squinting at the annotated contour lines of a topo map gets you some of the way there, but you really have to read it closely to understand the logic behind certain features. When you enter the *Minecraft* Fort Washington map, it's immediately clear that the winding pathway follows the shape of the hill into which it's cut. Similarly, it wasn't until I 'stood' on the Fort Washington site for myself that the logic of the position became clear; The fort didn't occupy the highest position, but it was placed on a crop of rock with a uniquely steep approach.

MM: Can *Minecraft* inspire interest in historical maps among those who would otherwise be disinterested?
LR: Yes, absolutely. We've shown this project to grade school kids and when we say "Who likes to play *Minecraft*?" pretty much every hand goes up.

MM: Without contours, would the translation have worked as well as it did?
PB: I think you really need the contour lines – or *something* that indicates a few points of elevation - to generate an interesting *Minecraft* map. The rise and fall of elevation is a big part of the aesthetic and play experience.

MM: How large a task was this to complete?
Leonard Richardson: About two days, and then a few more hours to write it up for the NYPL blog. The main thing I got out of it was an invaluable knowledge of the file format used to store *Minecraft* worlds, which I've used in other projects.

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Thumbs Up: The Rise Of Professional Gaming

Mark Oakley looks at how gaming has gone from the bedroom to the arena

What were you doing on Sunday 29th March 2015? Personally, I was most likely keeping an eye on my two kids, trying my best to stop them from arguing. Again. Perhaps you were enjoying a Sunday roast, or perhaps you were playing some games on your PC, or maybe even working.

Four young men in Los Angeles were playing some games on that very Sunday. They were also working, in a way, earning a joint prize of $400,000 for their efforts.

Welcome to the world of e-sports.

The men in this particular instance were members of Team Denial, a pro team backed by an international professional gaming organisation based in the United States. Denial eSports has sponsored teams in various pro gaming events across the globe, with the line-up of players changing as and when required. Denial eSports has been putting forward teams for various gaming events for a few years now, taking in titles including *Halo*, *League of Legends* and, in this latest victory, *Call of Duty*.

The exact location of this big win was the Call of Duty World Championships, held over a long weekend in Los Angeles, and 32 teams were competing against each other for a shot at that grand prize. Team Denial's backstory is much like the others in attendance that day. The only difference is that on this occasion, Denial won.

This is a world where button mashing, quick-thinking and teamwork really does win the day. For all those people who told you that sitting in front of your computer for hours on end did you no good, Team Denial and the other e-sports outfits are the counter argument. Events are now streamed on the internet and televised over in the States. In many respects, professional gaming has become as big as many other sports. There are packed arenas, pulse-racing encounters and even big-name signings.

It's also backed by real money. At the beginning of July, a Swedish media outlet bought ESL (the Electronic Sports

League), the largest e-sports organisation in the world, for a not insubstantial €78 million, giving it a majority stake in its financial holdings. In the first acquisition of its kind by a traditional media company, this marks a significant step in the continuing recognition of e-sports as a major industry.

According to community website e-Sports Earnings, this year has recorded $19.2m in prize money and rising so far, and the top-earning player of the year has earned over $288,000. In total, recorded prize money for e-sports events stands at over $133m.

All this money rolling about the place begs the question: how did e-sports become such a big deal?

Not Just A Game

E-sports is defined at dictionary.com as "competitive tournaments of video games, especially among professional gamers". The preserve of professional gamers, we're talking about people making money from playing games. And these gamers are young, sometimes teenagers.

Competitive, professional gaming really took off with the rise of broadband internet, as organisations such as America's Major League Gaming took note of the financial opportunities that gaming provided. Organisations like the MLG and the Electronic

> **"Competitive, professional gaming really took off with the rise of broadband internet"**

Sports League saw the vast potential of the gaming marketplace, a potential which has only further increased as technology has improved beyond recognition from those early days of pro gaming.

The Electronic Sports League is arguably the biggest reason why e-sports has developed at the scale it has, certainly outside of America. This oldest e-sports league in the world is self-styled by digital entertainment company and holding company for the ESL, Turtle Entertainment, as the global e-sports leader. With over five million registered gamers, over a million teams and millions and millions of games played, it's fair to say that the ESL is a major, major player in pro gaming circles.

Outside of the work put in by the tournament organisers and sponsors themselves, the industry needed a platform to

Where Do I Sign Up?

If you're interested in professional gaming, there are some fairly obvious but very important points to consider.

Professional gaming is very much like any sport. You'll first have to pick your game, then get to know it inside out, and study and practise like never before. This isn't for the keen gamer who enjoys playing every evening; this is for the kind of gamer who enjoys learning the subtleties of the game, learning its intricacies and tricks, knowing the very make-up of the game. This is for real money, and it's a short career – typically three or four years. For those who make it, though, the rewards can be great.

You'll also need to find a team, as this is a team sport. You can go into events as a solo free agent or with a ready-made or partially made team of your own. Either way, you won't get anywhere on your own.

As for where to sign, you could register your interest at the ESL website – **play.eslgaming.com/uk**. Pick the league you want to play in and sign up. If you want to register a team of you and your mates, get all of them to sign up and register for whatever league you want to play in. From there, it's a case of playing in various 'Ladders' or amateur tournaments and honing your skills. Gain exposure within the community and get online, and you might be lucky enough to be contacted by a pro team. Essentially, as a free agent, it's all about putting yourself out there and using the online community and the likes of YouTube and social media to showcase your gaming skills.

In terms of financial rewards, while the big tournaments do indeed pay big, there are lots of other tournaments still offering decent prizes within the major e-sports leagues. For example, here in the UK the ESL UK Premiership for *Counter-Strike: Global Offensive* and *League of Legends* is a competition open to all UK residents with a competitive qualifying structure to get yourself on board. The event will be streamed live on Twitch, and the prize pot is £10,000, which is not too shabby.

Away from the ESL, you can also take part in Gfinity's line-up of tournaments by signing up on its website at **www.gfinity.net**. With over 100 online tournaments every month, there are cash prizes to be won if you're good enough.

As for getting big sponsorship, that's really again a case of getting good at it and getting your name out there. Bottom line is that sponsors will come calling if you and your team make waves in the gaming world. The more noise you're making, the more likely you're going to be heard. Play lots, win big, work your way up the community and then maybe you'll be in with a chance.

Just be aware, it might not be all sunshine and roses. It's really, really difficult to get truly, competitively great at gaming. As in any sport, long hours and the pressures of remaining competitive are par for the course.

have the gaming seen by a wider audience. Step forward Twitch. When it was launched in 2011, its dedication to live game streaming meant that gaming tournaments have helped its own popularity to grow alongside it. By reaching a ready and willing audience, e-sports have simply grown from strength to strength.

It's undoubtedly more of a phenomenon in Asia and the United States, but while we've taken a while to catch up, we have also recognised the need to take it seriously here in the UK.

Gfinity Steps Up

Gfinity has become a big name in UK e-sports since it converted a section of Fulham Broadway's Vue Cinema into a dedicated 600-person e-sports arena earlier this year.

Since March, Gfinity has been running its 2015 Championship with streaming of the gaming action featured on Twitch and at the Major League Gaming online channel. With a total prize fund of over $500,000 for the full calendar of events, this

> **"The industry needed a platform to have the gaming seen by a wider audience. Step forward Twitch"**

major competition will culminate in the end of season finale in September, and it's become a hugely popular season, with over 30m online views across 25 countries at its halfway point.

More recently, the Arena has begun its hosting of the Call of Duty EU Pro League season, mimicking a similar event held for American gamers and pitting eight of the best *Call of Duty* teams in Europe against each other.

The introduction of the Gfinity Arena was a huge step for take-up of pro gaming in the UK, and it's further proof of our increased recognition of just how far gaming has come in recent years. **mm**

E-sports Scandals

Just like in other sports, e-sports hasn't been without its fair share of scandals.

In 2010, several players of *StarCraft* were found guilty of fixing matches for financial gain. They were fined and banned from gaming.

Collusion has been found to happen elsewhere, most notably at the Major League Gaming Summer Championship in 2012, where some teams were told that they couldn't have their prize money because of their colluding.

Over the years, Valve has been forced to ban various pro *CounterStrike* players found of fixing matches for financial gain. And in one of the most high-profile stories surrounding wrongdoing in *League of Legends*, South Korea gamer Min-Ki attempted suicide after he admitting to match fixing in 2014.

The Games And The Stars

In terms of the games that are most often played, there's very much a common theme. Shooters, such as *Call of Duty* and *CounterStrike*, take place alongside multiplayer online battle arena titles, such as the frighteningly popular League of Legends and more recently *Dota 2*.

Dota 2 has become a very big deal indeed, with prize money for this year's 'The International' event sitting at a ridiculous $15m – Valve has smartly used crowdfunding of a compendium of in-game items to build up the pot. The tournament itself will be taking place this August in Seattle and will see 16 invited teams do their stuff on the big stage.

Some of those teams will include Europe's Team Secret, topping the *Dota 2* league table at the time of writing and recent winners of a major ESL *Dota 2* tournament in Frankfurt.

Team Invictus is another big name in *Dota 2* circles, having won the $1m prize pot in 2012. The individual rosters of these teams change over time, but Team Invictus still has some of the big players in the game, including 'BurNIng' Zhilei Xu, described as one of the best, most experienced *Dota 2* gamers in the world with several awards to his name.

In League of Legends, Faker is a name that is revered the world over. The 19-year-old Korean became a legend himself when he was featured in ESPN's first ever e-sports issue of its magazine. He has dominated the sport in recent years, becoming a global e-sports phenomenon in his own right.

Then there's Manuel 'Grubby' Schenkhuizen, a Dutch e-sports icon who has won multiple *Warcraft 3* world championships in becoming one of most famous pro players

▲ *Starcraft 2 and World of Warcraft are typically popular e-sports titles*

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Remembering...
Autoexec.bat and Config.sys

David Hayward reflects on the two most important files used in DOS

When we recall the DOS days, it's often with a rose-tinted hue. However, while it was less complicated than a modern operating system, it wasn't quite as straight forward as we often give it credit for. For one, getting a game to work often meant having to play around with the two most important files on a DOS-driven PC: Autoexec.bat and Config.sys. These files defined how the environment started up, what drivers were loaded, what the temp directory was, the Path statement and where other commands could be accessed.

Autoexec.bat loaded the drivers, set things like the Sound Blaster card IRQ and DMA values and offered the ability to load certain drivers into the high memory area and the UMB (Upper Memory Block) to free up valuable conventional memory (the first 640KB) for running of games and programs.

Config.sys was the main configuration file for DOS, and allowed you to assign certain values to device and memory parameters. You could specify disk buffers (loading them high with BUFFERSHIGH=), and load up drivers for HIMEM, EMM386, and ANSI.sys.

Compared to today, it sounds terribly complicated, but we got the hang of it – and in the end we could either own a selection of DOS boot floppy disks that served a certain purpose, such as high memory loading, more 640KB for a game, loading up the CD-Drive driver, and so on. Or we could create a long and elaborate set of files that loaded stuff up depending on what menu options we defined within the Autoexec.bat file.

The History

The Autoexec.bat and Config.sys files appeared around the DOS 2.0 stage, when the need for loading peripheral drivers became the norm. The PC was beginning to grow, as were the number of different uses for it.

It no longer belonged exclusively to the office; home users also had PCs and, as a result, peripheral makers started to expand their catalogue of products. The PC was also starting to become a formidable gaming platform, and with that came devices such as soundcards, joysticks, ever more powerful graphics cards, and so on.

With more devices now available, the conventional memory limit was starting to get a little tight. Soon, third party memory managers such as QEMM became available, which offered more available conventional memory by auto-analysing your Autoexec and Config files and creating its own version of each.

The Autoexec and Config files lasted all the way up to DOS version 7, for Windows 95, 98 and Windows ME. Although by then they were rapidly losing their ability to make any significant change to the way the system was defined at startup.

The Good

You could have a collection of boot states, that gave you more conventional memory, loaded up certain drivers, even some that auto-ran virus scanners and connected to a network for installing DOS and Windows 3.11 onto a client PC.

Did You Know?

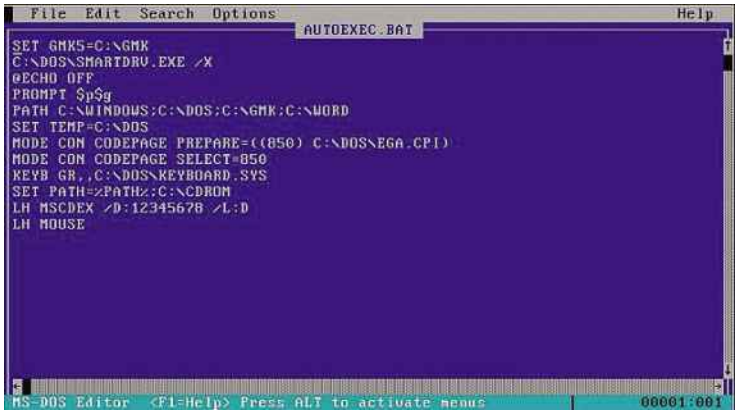
- If you installed Windows 95 over DOS and Windows 3.11, then the Autoexec and Config files were auto renamed to allow dual booting into both environments.
- The Toshiba CD driver was smaller and used less memory than the Oakcdrom.sys driver loaded in Config.sys
- Smartdrv was one of the main issues with loading games. Although it worked well for disk caching for optical drives, and for loading up games quickly, it often conflicted with the game later on and chewed up a lot of conventional memory.
- CTMouse often worked better, and with less memory used when loaded high in Config.sys

The Bad

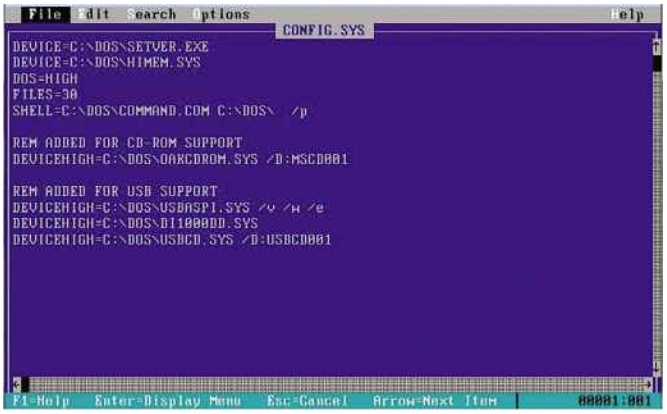
They could get quite confusing, and you'd often end up wasting many hours trying to free up that extra 1KB of memory to get *Star Trek: 25th Anniversary* running.

Conclusion

Autoexec.bat and Config.sys once ruled the PC in a way that no other two files have ever managed since. They were the most powerful text files, and if you could master them then the operating system and the hardware within the PC was yours to command.



An example Autoexec.bat file, loading high the CD-ROM driver and mouse



Config.sys, often more confusing as Autoexec.bat but just as powerful

How 3D-printed rats could offer schools a vegetarian dissection

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A fresh take on technology

Component Watch

Component Watch

Android and iOS may get most of the headlines, but there are some decent Windows tablet deals too...

Although a lot of people like the idea of replacing their laptop with a tablet, the truth is that it's usually not possible. Not because tablets are low-power (although they often are that) but because most of them simply won't run the software you want to put on them. If you do any sort of work, there's a good chance you have to use proprietary software or third-party applications that need Windows to work. So with that in mind – how about a Windows tablet? And if that sounds like a good idea, here are the best prices you can find.

Deal 1: HP ElitePad 1000 G2
RRP: £1,100 / Deal Price: £1,040

This is the version of the ElitePad 1000 G2 with slightly less storage – 64GB rather than 128GB – but even then it's batting way above the average of most tablets. Powered by an Intel Atom Z3975 running at 1.6GHz with 4GB of RAM, it's an excellent performer. 10.1" 1920 x 1200 screen, two cameras and built-in 4G mean it's clearly aimed at the productivity end of the market and priced as such. This isn't much of a discount, but when you're paying this much, every penny you save seems worth it.
Where to get it: eBuyer – bit.ly/1HgyvYc

Deal 2: Lenovo Thinkpad 10
RRP: £799 / Deal Price: £726.73

If you want similar capabilities but at a much lower price, the ThinkPad 10 has the same CPU, same amount of RAM and same mobile 4G capabilities as the ElitePad, as well as a full 128GB of storage. It also has a slightly worse 10.1" 1920 x 1080 screen, slightly worse front camera, and slightly less connectivity. But for £300 less, it's a surprisingly close second place. We don't think you'd notice the difference.
Where to get it: CCL – bit.ly/1JQ4xhx

Deal 3: ASUS Transformer Book T100TAM DK024P
RRP: £399 / Deal Price: £335.67

If laptop-replacement is your plan, you could do much worse than this Asus Transformer, which is a convertible tablet that comes with its own hardware keyboard docking station. Ideal for workers of any kind. The specs aren't great – a 1.46GHz Intel Atom Z3775. only 2GB of RAM, no 4G and a 1366 x 768 10.1" screen and only one 1.2MP front camera, but at this price it's still not a bad buy. It's aimed at office work rather than all-singing, all-dancing gaming and media, and for the money you spend, it's still a very good deal if a work system is what you're after.
Where to get it: Dabs – bit.ly/1JQ4JNZ

Deal 4: Acer Iconia W4-821P
RRP: £399 / Deal Price: £316.26

The 8" Acer Iconia W4-821P has a faster CPU than the Asus system – an Intel Atom Z3740 at 1.8GHz – but the price is lower because it lacks its hardware keyboard and large-format screen. Other specs are similar (2GB RAM and 64GB storage), and others are better two cameras and built-in 3G), but ultimately if you're looking for a productivity device, this is a lot more casual. Good if you want to replace your phone with something more capable. Maybe not for replacing a laptop.
Where to get it: CCL – bit.ly/1TmlyS9

Deal 5: Linx 8
RRP: £119.99 / Deal Price: £98.34

Basically the cheapest Windows 8.1 tablet around, the Linx 8 has a 1280 x 800 8" screen and Intel Atom Z3735F CPU at 1.33GHz. With 16GB storage and 1GB of RAM it's not going to set the world alight, but at this price you could kit out a whole team for the price it takes to buy one ElitePad – and it'll do basically the same stuff as that, if slightly slower. For less than £100, it's hard to be too upset!
Where to get it: Misco – bit.ly/1HceT5e

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– Benjamin Zephaniah

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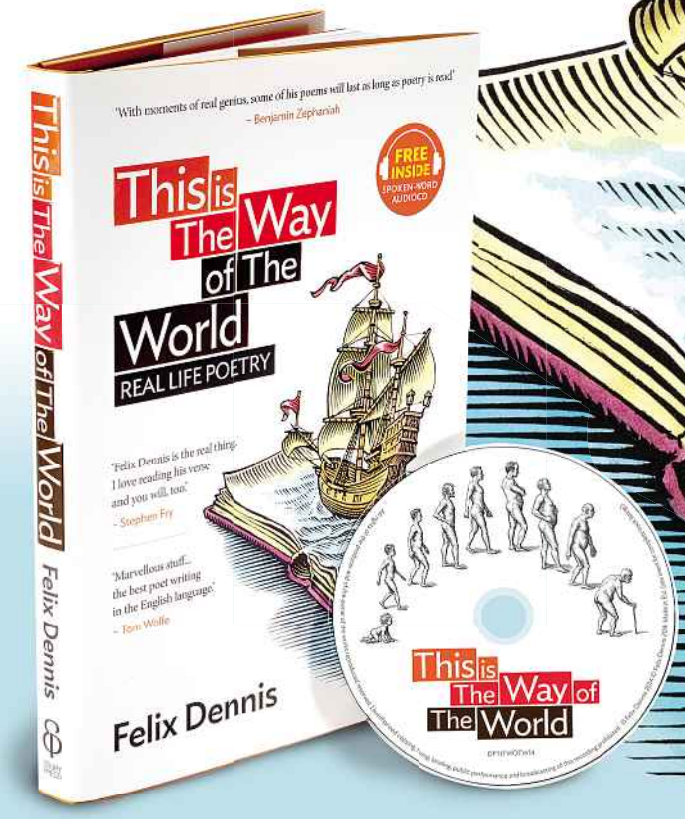

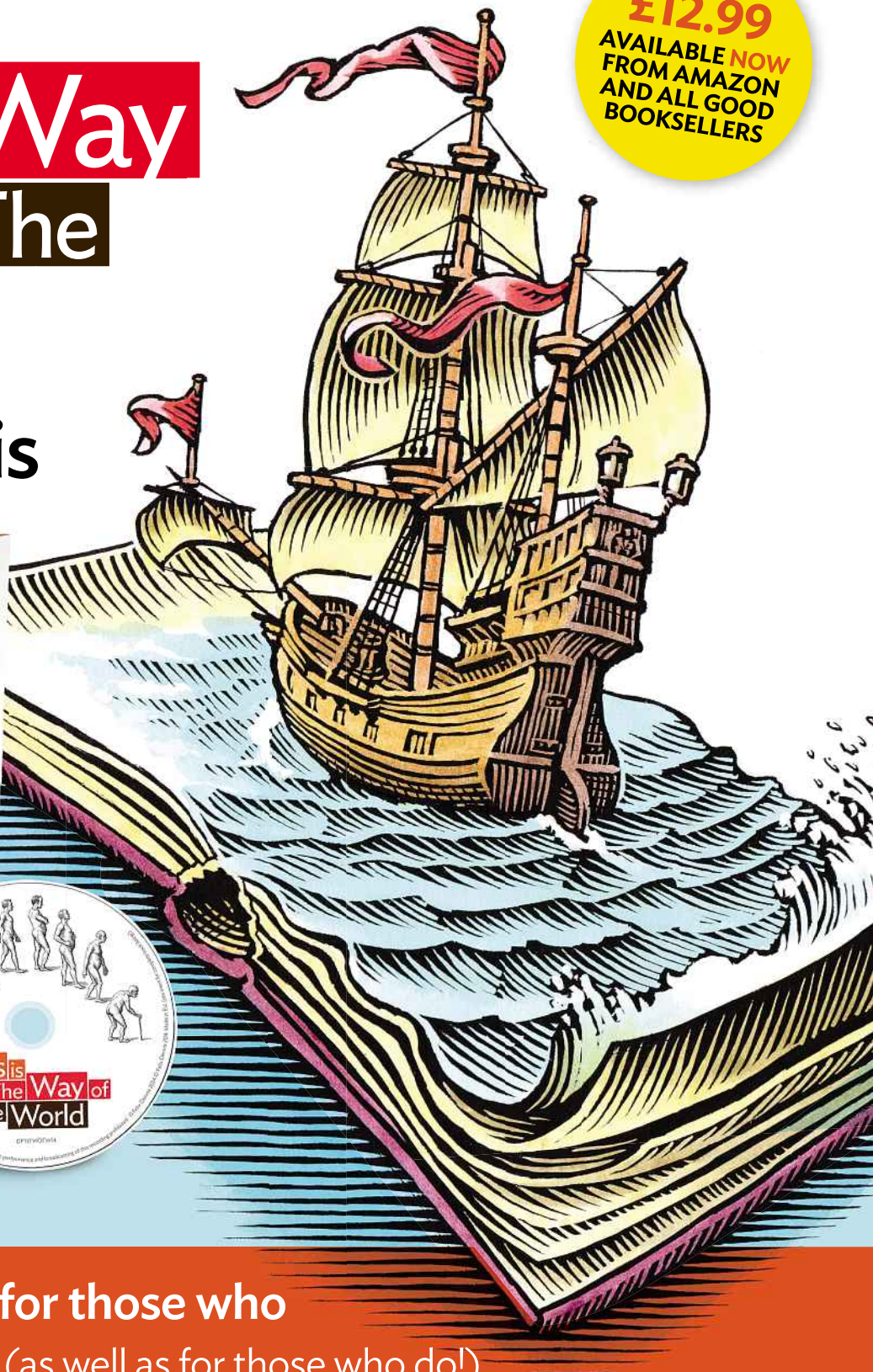

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www.felixdennis.com contains many poems, published and unpublished, as well as a library of sound recordings and video footage of Felix Dennis's verse and poetry tours.

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Mastercard Trials Facial Recognition

Smartphone app takes a good look at you for online purchases

Financial services firm Mastercard is looking right at you with a trial of facial recognition technology for verification of online purchases.

CNN reported on the news, with a security expert for the company stating that the 'Selfie' generation would find it "cool". No doubt, but is this a technology that can really get off the ground? Google dropped facial recognition on Google Glass without strong security in place, so Mastercard will have to prove that this is a secure way of going about things before it's truly a goer.

Interesting development, nonetheless.

US Drone Knocks Down Woman

Reports of impending robot apocalypse unfounded

To America we go now where a drone actually knocked a woman unconscious after it first crashed into a building and then fell on her.

The unfortunate incident happened at the gay pride parade in Seattle over the last weekend in June, and the man who piloted the drone has 'fessed up to local police. The drone was a weighty fella at two pounds and cost around $1,200, according to reports, and fortunately the woman is said to be absolutely fine now.

The incident does raise many a question about the use of drones in everyday life, however, and if people's safety is at risk in any way, you can expect those questions to keep on coming.

QUICK BITS... The Pebble Time smartwatch is now available to pre-order in the UK

The UK's largest mobile operator, EE, has been fined £1 million by Ofcom for breaching its rules on handling customer complaints.

The industry regulator said that from 2011 to 2014, EE didn't give certain customers adequate information on their rights to take their complaints to an independent body. As it didn't inform customers in writing of the fact, Ofcom has decided to lay down this pretty significant fine.

EE has since stated that it has made "significant improvements" since the period in time that this fine relates to.

If someone told you that you had to work for free for the rest of your life, you probably wouldn't be too pleased. Yet that's exactly what pro-piracy groups are asking content creators to do.

The fact is that piracy is wrong and it hurts the industries it affects and those who work in them. We all know that, though, don't we? So why do so many of us still head to sites like the Pirate Bay?

That's what the media industries need to ask themselves, rather than chasing after piracy websites and downloaders.

Nothing they've done has managed to take down the Pirate Bay or discourage those who use it, but as Mark Pickavance points out this week, there are a few things they haven't yet tried. But will they ever try them? I hope so, for the sake of everyone involved.

Until next time,

Anthony

Editor

Reddit Says Sorry For Sacking

Community reacts with ire over employee ousting

Reddit bosses have apologised to users over the sacking of an employee, with the Reddit community having its collective angry voice heard.

Victoria Taylor was fired, which led to various sub-reddits being shut down in protest. Taylor was responsible, among other things, for overseeing Reddit's Ask Me Anything section, which basically allows users to ask questions of celebrities, politicians and the like. With little information forthcoming about her sacking, the Reddit community voiced its angry opinion and also spoke with its fingers, shutting down around 100 sub-reddits in protest.

Now, Reddit bosses have said sorry as they have clearly realised that it's not good business to annoy the community that keeps it going. So why was she sacked? Who knows, and we'll likely never know for sure.

Meanwhile... On The Internet...

If you have ever taken time to consider what a tenuous thread modern civilisation hangs by, last week was a salutary reminder that your musing may not be misplaced. We're talking, of course, about the three significant tech failures – involving American Airlines (**tinyurl.com/MMnet71a**), the New York Stock Exchange (**tinyurl.com/MMnet71b**), and the *Wall Street Journal* (**tinyurl.com/MMnet71c**) – that came in quick succession and seemed to immediately send the US-based online press into a downward spiral of doom-mongering (**tinyurl.com/MMnet71d**) and Stephen Colbert running to his post-apocalypse hidey-hole (**tinyurl.com/MMnet71e**).

All three and the US government were quick to assure that none of the outages were due to an attack on their systems. American Airlines blamed router failure (**tinyurl.com/MMnet71f**), the NYSE a software update (**tinyurl.com/MMnet71g**), and the FBI implied that the WSJ outage was due to overload caused by the rush for news of the stock exchange outage. However, it's fair to say that not everyone's buying it (**tinyurl.com/MMnet71h**), and speculation continues unabated (**tinyurl.com/MMnet71i**).

It's not surprising really, considering that there's form for airlines being hacked to the ground recently (**tinyurl.com/MMnet71j**), and it's the third time 'technical issues' have downed planes this year (**tinyurl.com/MMnet71k**). Then you have Hilary Clinton telling supporters that China hacks "everything that doesn't move" (**tinyurl.com/MMnet71l**), which isn't exactly confidence-inspiring, especially at a time when mind-bogglingly large numbers of US citizens are finding themselves caught within the ever-widening blast radius of the massive Office of Personnel Management hack we covered a month or so ago (**goo.gl/uedWH4**), which now appears to have affected 21.5 million people (**tinyurl.com/MMnet71m**).

Then, when you also consider that even the so-called cyber-security experts sometimes find themselves on the receiving end of embarrassing incursions (**tinyurl.com/MMnet71n**), it may soon come a time when you'll be wanting a tin foil hat... or not, depending on whom you believe.

Oh, and by the way, if you were hoping the collective brains of North America's tech elite would help ride out this storm, we'd like to point out that its collective planning skills just led to a whole continent running out of IP addresses (**tinyurl.com/MMnet71o**). Sleep tight everyone!

Of course, if you think that's bad, Europe ran out of allocatable IPv4 space way back in 2012 (**tinyurl.com/MMnet71r**). Luckily we've got BT forging the way (**tinyurl.com/MMnet71p**). What could possibly go wrong? Well, quite a bit, apparently (**tinyurl.com/MMnet71q**)... But it's a problem that needs fixing, fast.

Whether or not the digital world is making us smarter or dumber is an interesting question. While the connected world puts more and more information at our fingertips, it's also accused of dumbing down delivery and shortening our attention spans. The differences between our paper and digital reading habits (**tinyurl.com/MMnet71w**) seems to hint that we have shorter attention spans when reading on a screen – as we quickly become distracted by links and other media or set adrift by the uncertainty of exactly what it is we're reading (i.e. a long- or short-form piece).

However, whether or not we retain information better via traditional or digital media is a very different question – and not one with a simple answer, as different people respond in very different ways.

Over in the US, last week saw San Diego host the massive Comic-Con event. It's usually the source of a slew of viral videos (**tinyurl.com/MMnet71s**), courtesy of both the film studios and TV channels that use it to flog their latest wares and the eager fans who record the Q&A sessions with their favourite stars (**tinyurl.com/MMnet71t**). However, this year the whole event has a new medium that could throw a spanner into some very coordinated PR campaigns: live streaming; especially via Periscope and Meekat.

A cursory search across Twitter will reveal that, despite continual warnings before big panel events at the event, many of the sessions have been streamed live by keen, tech-savvy fans (**tinyurl.com/MMnet71u**). Indeed, telling them not to, and hoping they wouldn't, seems to have been folly. We'll know for sure just how prevalent the whole thing is when the Star Wars event begins in Hall H shortly after this magazine goes to the presses – because, if there's a new trend in fandom, *Star Wars* is often the biggest manifestation of it, and because you can pretty much guarantee that Disney will be doing all it can to shut it down... It's certainly known for protecting its properties. Just ask the UK toy store that's now been stripped of its **starwars.co.uk** web address (**tinyurl.com/MMnet71v**) – though, in that case, you can probably see Disney's point...

.AVWhy?

Videos For Your Eyes... Not Necessarily For Your Brain

No piece of video we've seen this week has elicited bigger smiles from Team Meanwhile than the one that mashes up two of our very favourite pieces of animation. Though you may consider *Akira* and *The Simpsons* to occupy opposite ends of the artform's spectrum, somehow – like, say, chilli and chocolate – for some reason they go together so well. To wit: *Bartkira* (**tinyurl.com/MMnet71x**), a fan-made mock trailer that blends both to brillliant effect.

QUICK BITS... Apple Pay has been widely reported to be landing in the UK on July 14th

Caption Competition

Quick fact: we hate spiders. So we're not quite sure why we chose this as the picture for the caption competition. Never mind. Let's see your captions, so we don't have to look at the big scary arachnid any more:

- **JayCeeDee:** "If I study hard with my Mavis Beacon Typing Course I'll easily manage 500 words a minute when I grow up."
- **stevenfr:** "They said press Shift, Ctrl, Alt, Del, Page Up, F1, F11 And F12. Still no web!"
- **The Duke:** "Pack a bag, were moving!"
- **Nigel Palmer:** "Blimey, I have been spending too much time on Spider!"
- **Nigel Palmer:** "I had to call in a web building expert."
- **Thomas Turnbull:** "Someone said this was the quickest way to the web but I can't find it."
- **Htst:** "Where abouts is this world wide web everyone's talking about?"
- **Leigh Spriggs:** "Building up Spider Silk Road."
- **Gary Bore:** "Eight legs and I still can't find the Any key!"
- **Robert Wheelhouse:** "Foolproof way to stop you drunkenly emailing your boss at 1am."

Thanks to everyone who entered. And congrats to doctoryorkie, who came up with "Web expert: can't even press Ctrl + Alt + Delete."

To enter this week, head to the 'Other Stuff' section of our forum (**forum.micromart.co.uk**) and say something funny (but not too rude) about the picture below or email us via **caption@micromart.co.uk**.

Dixons Carphone Signs With Sprint

US-bound stores could lead to British invasion in time

Dixons Carphone (we still can't get used to saying that) has signed a deal with US telecoms outfit Sprint to open up 20 Sprint-branded stores in America.

The pilot programme could eventually see the British firm opening up 500 stores, with Dixons Carphone investing up to £20 million for a 50% stake, and this is a major expansion deal for the company following last year's merger.

In case you didn't know, Sprint is one of America's largest mobile carriers, so this is potentially a major breakthrough into the States for Dixons Carphone. No wonder the firm's deputy chief executive, Andrew Harrison, referred to the move as "a very exciting venture for us ... a significant step in growing our business in the US." The firm's shares did okay following the announcement too.

Happy Birthday, Phil McKay!

Have an awesome day

Is your name Phil McKay? Is this you, reading a copy of *Micro Mart*? If it is, then happy birthday from everyone here and from Sherie who kindly sent in this photo.

Now, readers, if any MM fans you know are celebrating a birthday soon, write in and let us know, and we'll gladly surprise them right here – because we're nice like that.

Snippets!

New Zealand Makes Trolling A Crime

New Zealand has approved a new piece of legislation that makes trolling an actual crime.

The Harmful Digital Communications Bill was approved by parliament and means that the act of trolling online could result in the perpetrators being fined or even sent to prison, all for using deliberately harmful, threatening or offensive language.

In order to enforce the law, agencies will work alongside the likes of Facebook, Google and Twitter to remove any such trolling content.

Pirated Software Up By A Quarter

According to a new study from application protection firm Arxan, pirated software and content online has increased by nearly a quarter over the past three years.

Its State of Application Security report details that the cost of keeping up with hacking is considerable, with enterprises having to spend the best part of $500bn due to malware associated with pirated software. Wow.

Facebook Rolls Out Messenger Payment Service Across US

Facebook's payment service between Messenger users is now available across the entire USA. The service is completely free and allows users to send money to each other, via their accounts which are linked to a debit card. The system requires the Messenger app to use, and moving money to a friend is as simple as tapping on the '$' icon within a conversation. Type in the amount, the recipient confirms receipt, and within a few days the money should be there.

We're not sure whether or not Facebook will be looking to roll this out to other countries following the US launch. Presumably, it's going to see how it fares in the US first.

One-Hour Service For London Prime Users

Prime Now comes to UK

Amazon has launched its Prime Now service outside of the US for the first time, giving Londoners the chance to take advantage of a one-hour delivery time on items.

There are various caveats to this service. First of all, deliveries need to have a minimum order total of £20 per order. Second, the one-hour service costs £6.99 per order, otherwise customers can go for a free, two-hour same-day delivery slot. Thirdly, it's only available in certain areas of the capital to begin with, with the service expanding to all of London and other UK cities on top of that by the end of the year.

If you're particularly impressed with the delivery, you can also leave a tip, which all goes to the delivery person, according to Amazon. Yes, we can't see that happening a lot in the UK either.

amazon.co.uk

Wikipedia Now In Print

Yours for half a million dollars

We cannot claim to be connoisseurs of art, but this particular project is surely the very definition of a labour of love for the artist involved.

Michael Mandiberg has converted Wikipedia's 11.5 million entries into a print-friendly format, with the printed version available to buy for $500,000. Mandiberg is a regular editor himself having updated many pages to the site, and this project has been laid across 7,600 volumes with a content section alone covering 63,372 pages across 91 volumes. The final edition has been made available via self-publishing site Lulu.com, where you can also purchase individual volumes for just $80.

If you're thinking of doing something similar yourself, just be aware that you'll have to devote three years of your life as Mandiberg did. Good grief.

Jobs' Business Cards Sell For $10,500

American pays out big for Apple man's cards

At a private auction in California, an American chap has snapped up three business cards belonging to the late Steve Jobs.

This actually happened last month but passed us by at the time, we're afraid, The Apple boss' cards sold for $10.5k. Donated by a family that used to do catering for Jobs, the cards were used during his time as president of NeXt and his days at Apple and Pixar. As for Knowles himself, he said of his new purchase, "If there was ever a business card to have in your rolodex, it would be Steve's – we wouldn't be doing what we are doing right now if it wasn't for him!"

With the opening bid coming in at just $600, Knowles must have really wanted these bad.

QUICK BITS... **Online collectables marketplace Rareburg.com has launched a free online appraisals**

Samsung Courts Controversy Over Bloatware

Legal action over bloatware

China's Shanghai Daily has reported that Samsung is being sued because of the bloatware on its mobile handsets.

A consumer protection group, the Shanghai Consumer Rights Protection Commission, has launched the action saying that Samsung made it hard to remove applications that many consumers simply didn't need or want. It's launched this action now over anger at the increasing number of consumer complaints about pre-installed applications, with many consumers unhappy at the amount of space taken up by the apps and the impact on data allowances when these apps were updated.

The group's study into the problem noted the Galaxy Note 3 as an example, with no less than 44 pre-installed apps. The case has certainly shed some light on the thorny issue of bloatware.

AMD Struggles As PC Demand Drops

Tough times for chip maker

AMD's financial results should be out any time now, and the company has already warned investors that its second-quarter results will be worse than previously expected.

Having previously warned that revenue would be down compared with the first quarter results, AMD has since updated in a news release that sales have underperformed its worst estimates. Revenue is expected to be down 8% from the first quarter, and this would point to a continuing, slightly troubling theme for the company, which has already seen a year-on-year drop comparing first quarters of over 26%.

The reason for all this bad news is that PC demand remains weaker than expected and this is clearly starting to bite for AMD, Intel etc. Indeed, this is becoming a bit of a theme, so perhaps everyone should expect PC demand to remain low for the foreseeable future?

Damn you, tablets! Damn you…

Minecon Comes To London

Were you there?

London's Excel convention centre played host to a whole load of box believers over the first weekend in July as Minecon came to town.

A world record for the biggest convention for a single game, 10,000 attendees turned up to talk all things blocks, and there was all sorts of *Minecraft*-related goodness on display, including recreated famous paintings.

Alongside the exhibitors, costume contests, Q&As on how to improve at the game and interactive attractions, Mojang also laid out various new features coming to the über-popular title at its Upcoming Features panel. Talking on areas to improve on, Mojang discussed dual wielding of items and an expansion of The End, with more items and locations.

We love it when gaming reaches the masses.

Possible Prison For Laser Pointer

Don't point at aircraft, says judge

A Californian man has been convicted for pointing a laser pointer at an aircraft.

The two-day trial culminated in his sentencing, and Barry Bowser faces a possibly very serious punishment. Indeed, Bowser could be landed with a possible fine of $250,000 and a five-year prison term when his sentencing takes place later this year. He was caught as police officers noticed the laser was coming from his motorhome, from where he apparently aimed it at a sheriff's helicopter, temporarily blinding the pilot, with the pain lasting for hours.

Archos 50 Diamond

A quality sub-£200 phone, with farm more expensive features

DETAILS
- **Price: £170**
- **Manufacturer: Archos**
- **Website: goo.gl/3aZmkV**
- **Package contents: Archos 50 Diamond, USB charger, USB cable, hands-free kit, quick start guide, warranty book**

The colour scheme may look a little out of place, but the phone itself is great

The 16MP camera is the icing on the cake, and all for just £170

There are numerous mid-range smartphones available at present, finding one that manages to offer close to top of the range features at decent price can be quite difficult, though. Archos has, in the past, tried to bridge the gap between mid- and top-of-the-range with its products; offering good value for money with functional hardware.

The Archos 50 Diamond is another such smartphone, that has had a lot of attention since the company revealed it at the CES. It's not difficult to see why either; with a 5" full HD IPS screen, Qualcomm Snapdragon 615 Octa-Core A53 processor running at 1.5GHz – the industry's first ever 64-bit chipset – an Adreno 405 550MHz GPU, 2GB of LPDDR3 RAM, 16GB of internal storage and running Android 4.4.4 Kitkat, this is a phone that throws down the challenge to other handsets.

In addition to that little lot, Archos has also squeezed into the thin frame of the 50 Diamond a pair of micro SIMs, 4G, 3G, NFC, Bluetooth, a 16MP rear camera, an 8MP front camera and micro USB. The 2700 mAh battery is similarly good, lasting a couple of days with light use and an excellent seven and half hours under heavy use (games, videos, browsing and so on).

The build quality is good all-round. It's plastic throughout, but it doesn't feel cheaply made or lacking in any respect. It's a good weight too, at 140g, and is only about 8mm thick. One thing we weren't too sure over was the chosen colour scheme on the model we had to test. Hopefully there'll be the opportunity to pick a different colour, as lime green (or whatever it's supposed to be), wouldn't be our first choice. Still, it's certainly eye-catching.

The 16 megapixel camera is simply superb and captures high details in low light levels as well as producing some excellent colours. It's hard to fault it, but if there one thing we would improve it would be speed at which it takes a picture. It certainly seems a little slow compared to the likes of a Samsung S5 mini or a Lumia 930 for example.

Android 4.4.4 runs perfectly well on the 50 Diamond. The response of the screen is good, with very little lag to show; at least as the untrained eye can discern anyway. The combination of Snapdragon CPU and Adreno GPU does a good job of keeping the performance up to scratch too. Our CPU-killing Bloons Tower Defence 5 test ran well, but there's only so much a sub-£200 phone can handle before the seams begin to tear.

The Archos 50 Diamond is a really good mid-range smartphone. The company has done a great job of cramming it full of worthy features while still keeping the price lower than the competition with similar specifications.

mm David Hayward

Features
- Compatible with 4G / LTE download speeds
- 5.0'' Full HD IPS display
- Snapdragon Octa-Core processor
- 16MP low light back camera
- Dual SIM placement

A great smartphone with plenty going for it

HomeMonitor HD Pro

Impressive outdoor security with plenty of features

DETAILS
- **Price: £200**
- **Manufacturer: HomeMonitor**
- **Website: goo.gl/KfXNQd**
- **Requirements: Any modern browser, wi-fi 802.11 b/g/n, Ethernet, decent broadband**

The HomeMonitor HD Pro is a great outdoor HD camera, with a wealth of features

Security cameras have become so familiar in our surroundings that we barely notice them these days. You could argue that we've become a surveillance society, where our every move is being watched with close scrutiny. On the other hand, maybe we'd just rather be safe.

A mounted camera, though, isn't just to keep an eye on your valuables. There are many other uses, such as viewing the behaviour of wildlife, or keeping an eye on someone who's elderly and infirm. Regardless of the situation, finding the right camera with the features needed to make it useful can be something of a bind.

HomeMonitor may have the solution though in the form of its HD Pro Y-Cam. This is one of three camera models available and the most feature-laden of the three, from HomeMonitor with an impressive list of specifications. The HD Pro is a weatherproof encased camera that is designed to be mounted on an external wall. It records in 720p, has a FarFocus Lens technology for superior outdoors clarity, infrared night vision effective up to 15 metres away, a microphone, wi-fi, Ethernet and a free account to the HomeMonitor Cloud where you can store unlimited clips for the last seven days.

You can access the content anywhere, and save it to the free cloud access

In the box you get the camera itself, already fitted with the weatherproof shell and lens protector, a wall mount with cable management, a one metre Ethernet cable, three metre power cable, a pair of screws to mount the camera, various tools for all wall mounting, a wi-fi antennae and a well laid out quick start guide.

Fitting the camera is easy enough if it's near an already established network port, but wi-fi is simpler – though the signal can get a little weak if the camera is mounted outside a thick wall. Once fitted, simply create an account with HomeMonitor and you'll be presented with a dashboard view of any connected cameras, along with buttons for controlling the motion detection, power, alter settings and motion alarm settings.

You can view the footage and control the finer aspects of the camera via any browser, but there's also a dedicated Android and iOS app, available through the relevant app stores and a Roku app.

The free HomeMonitor Cloud option is pretty good. With it there's aforementioned seven day saves, plus unlimited live views, unlimited downloads and unlimited alerts. If you require more than seven days' worth of saved footage, then for £30 per annum you can upgrade the cloud package to 30-days of saved recordings.

The HomeMonitor HD Pro is a really good setup. It may seem a little extreme for the average home owner, but that all depends on how you intend to use it and where you live. It's also a little pricey at £200, but considering what you get in the package and what it's potentially protecting, then it could well be a worthwhile investment.

We were impressed by the quality of the recording, the night vision and the cloud storage, as well as wi-fi connectivity and everything else. If it's something a little less intrusive you need, then we'd recommend you view the other indoor camera models available from HomeMonitor.

mm David Hayward

A great outdoor security and network camera

HP Officejet Pro 8610 e-All-in-One

Mark is pleasantly surprised by a budget office printer from HP

DETAILS
- **Price: £118 (Ebuyer) £88 after cashback**
- **Manufacturer: HP**
- **Website: wwwhp.com**
- **Requirements: USB connection, PC running Windows XP or later, Mac running OS X v 10.6-10.9, 1GB free hard disk space, Internet connection; CD-ROM drive**

Having seen a slew of multifunction printers recently, I've realised that the differences between them often come down to daily running cost, and not initially outlay. That's critical in the typical small office scenario, because a low print volume printer can get a sudden shock to the system should the business rapidly start growing.

Some products score highly on initial outlay, but are less desirable when you start looking at cost per page when ink becomes a major overhead. Or that's the theory, because the HP Officejet Pro 8610 e-All-in-One – at least in respect of running expense – appears to entirely contradict the cheap printer/high ink cost model we accept as standard.

For less than £90, afteryou've take advantage of the HP cashback offer, you get a single bin printer that can also copy, scan and fax with automatic two-sided duplex printing. Its wireless and wired network compatible, cloud capable, has a 35-sheet document feeder for the scanner, offers borderless output and it can print even print directly from a USB key.

Another plus point is that HP gave the Pro 8610 four ink cartridges (CYMK), and these are coupled to a print engine designed to generate 1200 dpi black output or up to 4800 x 1200 dpi colour, on photo quality paper.

> **"Cheaper than many multi-function inkjets we've come across"**

Print speeds are a more than acceptable 19ppm for black and 14.5ppm for colour for normal quality, though it can go even quicker in draft mode. First page arrives in around 12-13 seconds, so waiting for the printer won't be a major office complaint.

Like the majority of its competitor products, the HP Officejet Pro 8610 e-All-in-One uses a repurposed phone touch display to control user requests. It's a small 2.65" one, but the interface is easy to follow and responds well to chubby fingers jabbing at it..

So where is the HP Officejet Pro 8610 e-All-in-One less wonderful, then? Well, as these things go, this is a very big plastic box, measuring a minimum of 499.3 x 468.9 x 300.5mm. With the output tray deployed it becomes 647.5mm deep, a scale that would be difficult to ignore on a typical workers desk. Yet, curiously, being so large it's actually not that heavy, at a snip under 12kg. That's good if you need to move it, but not enough weight to stop the printer swaying gently when engaged in full speed operation.

That hints at a build quality that's not the greatest you'll find out there, and that borderlines on flimsy in some other respects.

The single input tray, for

example, is a weakness – in that you can't use alternate stock, and if you want to use envelopes you'll need to remove any A4 paper first. The output tray is also holds substantially less than the input, which could cause issues on a big print run.

However, what's critical to either a home or small business user is how much a typical monochrome or colour page is going to cost them. Because, historically, using inkjet output isn't the cheap printing option; in fact, it can cost a fortune.

Like most inkjet printer makers these days, HP makes two sizes of cartridge for its designs – and the 'XL' ones offer the best cost option. The HP 950XL costs £23, and is good for 2,300 pages at 5% coverage. That's a cost per page of 1p, and those are at official ink prices, which I'm sure you can better elsewhere than HP's own store.

The colour CL inks are just £17 each, but only hold enough for 1,500 pages, which – with all three colour inks in use – works out at about 3.4p a page.

That's cheaper than many multi-function inkjets we've come across, especially older designs that use the annoyingly inefficient three-colours-in-one cartridge design.

The only caveat is that some of Canon's latest designs, like the more costly Maxify MB5350 I covered recently, are even a little cheaper at printing than this model is.

For those who don't mind a printer that's the size of beached whale, and only need single paper source printing, the HP Officejet Pro 8610 e-All-in-One is actually a much better value device than I'd initially expected.

Not only is it cheap to buy, but the running costs are very affordable too. I just wish it was engineered to a higher specification. Because in this context 'office' is just another word for 'abuse', and I'm concerned as to how much of that this printer could reasonably take.

Thankfully though, as a promotional deal, HP is offering a three year warranty currently.

mm Mark Pickavance

A cheap inkjet office printer that's oddly inexpensive to run

Key Features

- 19ppm Mono Print
- 14.5ppm Colour Print
- Print/Copy/Scan/Fax
- 250 Sheet Input Tray
- 35 Sheet ADF
- 4800 x 1200 dpi Print
- 128MB RAM
- USB, Network & Wireless
- HP PCL 3 GUI, HP PCL 3 Enhanced
- Automatic Double Sided Printing
- Windows & Mac Compatible

SteelSeries APEX M800 Gaming keyboard

SteelSeries new Apex M800 keyboard offers both colour and function, for a price

DETAILS
- **Price: £160**
- **Manufacturer: SteelSeries**
- **Website: steelseries.com/gaming-keyboards/apex-m800**
- **Requirements: Windows XP, Vista, 7, 8, 8.1 (32/64 bit bit) or Mac OS X 10.7.5+, 10.8, 10.9 (32/64 bit bit), 2x USB 2.0 ports**

I covered the original Apex keyboard from SteelSeries, and concluded that, while it was acceptable for gaming it wasn't much use for other keying activities. That design was also enormous, like it had been conceived by an ironing board maker on his day off.

The new M800 addresses both those issues directly, being both a much less imposing scale and also now built around mechanical key switches. However, in reality, this amounts to a major revamp in almost every respect. Adding a per-key definable backlight LED system, in-built USB hub (two-port) and compatibility with SteelSeries Engine3 customisation tool.

This brings the Apex design into line with Corsair's K70 RGB, a similarly priced product that offers mechanical keys and per-key lighting control.

What's different here is that instead of using the Chery MX RGB switch as others have done, SteelSeries designed its own switch called the QS1 to provide a quiet and short key action while allowing the key tops to illuminate as well.As such, the action is noticeably shorter than you will have experienced with a Cherry switch, but it's very positive and certainly seems to lend itself to high speed repeated presses that are common in games.

In terms of the layout it's one of the more normal gaming designs I've come across, with only two minor diversions from the classic full keyboard layout. On the far left there is a macro key cluster consisting of six keys (labelled 0-5) that can be programmed with almost any combination of presses using the Engine3 software tool. As useful as this is, it tended to confuse this writer; I kept going for Macro key 0 instead of the Escape key that I was hoping to hit. The other adaptation is the oversized spacebar, which

Specifications
- Weight 1390g
- Size (WxHxD) 510 x 174 x 42mm
- 2m USB Cable Length
- Zero Ghosting, 256 Keys at Once
- Six extra quick access keys
- All Keys are Programmable
- One-touch multimedia controls via F-keys
- QS1 Switch – 3mm Throw, 1.5mm, Activation/Reset, 45cN Force. 60M Clicks
- Intuitive and Simple Macro Editor
- Text-based Macros (Direct to Console)
- Custom Profiles Per Application
- Switch profiles across all SteelSeries Engine devices
- Number of Illumination Colours: 16.8 million (eight-level RGB)
- Unlimited lighting layers,
- Pre-set effects, create your own
- Illuminated custom cool down timers
- Individually Illuminated Keys - centred LED, Clear Housing, Minimized Bleed

SteelSeries has made double height so anyone should be able to find it in a pinch. Compared with the split space bar nonsense of some designs, I much preferred this alteration.

The rake of the keyboard isn't steep, and for those who want it steeper a couple of larger rubber feet are provided that can be used to raise the back marginally. These do the job well, and help to retain stability while stopping any keyboard action from vibrating the table top it's placed on.

The only other accessories are three alternative key tops for those who can't accept that Apple don't make the most popular computers on the planet and want to see the 'option' key replace the Windows flag. What each key top says is pretty much irrelevant, because the M800 is totally reprogrammable, and even includes separate processors for handling keyboard inputs and its on-board illumination.

For those that love lighting effects the M800 is a wonder because, if you can think of a combination of colours you'd like, it's probably possible to program them to dance across the keys. The only limitation I've noticed is that you can only bind one type of effect to each key, so it can be reactive or animated, but oddly not both. Also some of the effects, like 'cooldown' colour changes, can only happen if you're running the Engine3 software, where others once programmed will work without that tool being in memory or even installed.

For example; if you load up one of the default modes like the matrix green animated effect, it will still work even if the PC it's attached doesn't have Engine3 loaded.

I have but two concerns with the Apex M800, and the first is that it is more than double what the original Apex cost. The other is more a personal issue where, with the size of my hands, I found the key tops rather too close together for rapid typing. That didn't impair its gaming ability, but for punching words/code into the computer I'm still a huge fan of the 6GV2 (can we have a V3, please?) over this particular design.

Where this works well, though, is in respect of how quiet it is. Compared with most Cherry MX-based keyboards this one is effectively silent. That could be useful if you like to play late into the night or you have youngsters that are easily woken.

At this price the Apex M800 was always going to be difficult to justify, because as nice as the lighting is, you can't gaze at it while you're gaming. The key action I liked, personally speaking, but it's a very individual thing, and I'd definitely try one out before parting with this sort of money.

This is a substantial improvement on the original Apex, but the new levels of sophistication have pushed the price a bit too high. If only they could make this design for closer to £100, then I'd be less reticent about recommending it.

mm Mark Pickavance

Mechanical switches and LED backlights are an expensive combo

Archos 101 Oxygen

A tablet that's a breath of fresh air

DETAILS
- **Price: ~£169.99**
- **Manufacturer: Archos**
- **Website: goo.gl/HcmFTk**
- **Required spec: Google account for Play Store upgrades/ apps/access etc.**

The Archos 101 Oxygen 10.1" tablet is light, and performs well

With a good all-round build quality, it's a capable tablet for most users

Archos is a familiar name in the tablet and smartphone market these days, and a name that has earned some respect from users and critics alike. The company has had some shaky products in the past, but these last few years have seen it shine and come out with a catalogue of impressively designed kit.

The Archos 101 Oxygen is one such product. A remarkably slim and light weight 10.1" tablet, it boasts a full HD IPS 10-point multi-touch screen, a quad-core Rockchip RK 3288 ARM A17 processor at 1.8GHz, a Mali T764 quad-core GPU, 2GB of memory and 16GB of internal storage. Furthermore, there's a micro-SD card slot with support for up to 64GB cards, a rear 5MP 1080p video camera, a front 2MP camera, USB OTG port, micro HDMI, micro-USB, Bluetooth, GPS, dual speakers and it comes with Android 4.4.4 (Kitkat).

It's not a bad design; the raised, metallic power button on the right-hand corner is conveniently placed, as too are the volume rocker and connection port along the top of the tablet – with the headphone port located on the opposite corner of the power button. Admittedly, the ports do seem to be a little close to each other, with some larger cable heads in place things could get a little crowded, but it's not often something like that will happen.

The rear of the tablet is metal, giving it a little more weight and greatly improving the quality and the feel. The outer edges are plastic, but tough enough to withstand knocks and without compromising on the aesthetics.

The touchscreen responds well, as do the CPU and GPU. We played around with a few games that take their toll on a tablet, *Bloons Tower Defence 5* being one and we were happy to see that the 101 Oxygen was more than capable of keeping up with a Samsung Galaxy 10.1.

Battery life was pretty good too, with it managing to last roughly six and half hours after a mix of gaming, browsing and watching video. With light use, though, that life can be considerably extended .

> **"A tablet that's capable of keeping up with one costing a hundred pounds more"**

Archos hasn't incorporated too many pre-installed apps on the 101 Oxygen, which makes for a refreshing change. There's just an Archos video player and a remote control function, the rest is stock Android stuff and ready to be personalised to the user's tastes.

Though not in the shops at the time of writing, hopefully this model will be by the time you read this. The final price may differ, but it's estimated that it'll cost in the region of £170, which is certainly not a bad price considering what you get; in this case a tablet that's capable of keeping up with one that costs at least a hundred pounds more.

The only negative was the quality of the cameras. While reasonable, they did seem to lack the clarity and quality of some other examples we've seen However, they weren't all that bad and would probably suffice for most, even those who use video calling. The iPhoneographerm or whatever they want to be called, would probably scoff, though.

This is a pretty good tablet; It performs well, has enough connectivity and features and is lightweight enough to be carried around in a bag or in your hand for some length of time without unnecessary strain. It's a perfectly fine tablet for 99% of the users out there and will continue to be so for a good couple of years.

mm David Hayward

A pretty decent 10" tablet for the price

Macrium Reflect 6

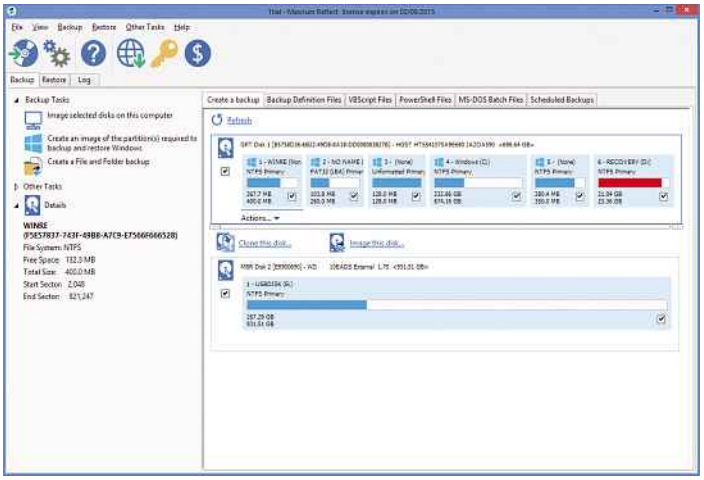
Protect your PC with a backup utility that offers easy-to-use templates, SSD support and more. Roland Waddilove is impressed

DETAILS
- **Price: £47.95**
- **Manufacturer: Paramount Software**
- **Website: macrium.com**
- **Required spec: Windows XP, Vista, 7, 8, 2GB RAM, 1GHz processor, 130MB disk space.**

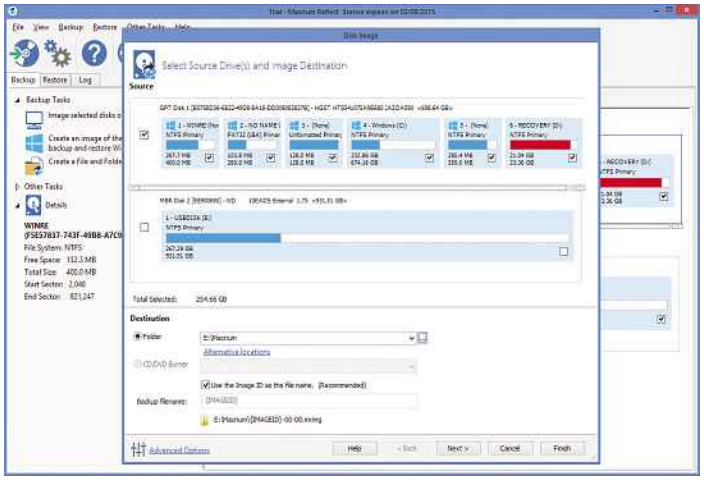
With Windows 10 here at last, many people will be upgrading, but are you the cautious type that will back up their PC before they start or the sort of person that crosses their fingers and hopes nothing will go wrong? Backups are essential when upgrading and also generally to combat disk failure and malware. Macrium Reflect is a popular backup program that is available in free and paid versions, and the latest one has some brand new features that make it better than ever.

There are three backup tasks and a whole disk drive can be backed up, which includes all the partitions, just the partitions needed to back up and restore Windows or a file and folder backup. When backing up partitions you have a choice between copying just the used sectors on the disk drive or all of them, even the unused ones. Copying unused ones could be useful if you need to restore a disk and then try to restore deleted files because they might still be somewhere on the disk in unused sectors.

The usual options are present and the backup can use three levels of compression according to whether you want speedy backups or to save disk space.



There are powerful features, but default settings make it easy for novices to use



You can back up whole disks or files and folders to USB drives and there's SSD support

Backups can be password protected, verified that they are okay when the job is done, and the PC can be shut down afterwards. This is great for setting it going at night. A CD/DVD burner can be used to store backups, but it would drive you nuts and a USB drive is the only sane destination.

Differential and incremental backups can be selected, plus Grandfather, Father Son, and incrementals forever. Each backup has a template, which defines the rules to be used and these can be left as the default or customised. The templates are new in this latest version of Macrium Reflect and you can customise them by choosing how long to keep full and incremental backups, when to purge old ones, such as when the backup drive is running short of space, adjust the schedule determining when they will run and so on. You can also create your own custom backup plans too. Once set, everything is scheduled and runs automatically.

The incrementals forever backup template is another new feature and after a full backup, it performs incremental ones. It basically manages things, consolidating the oldest automatically. Incremental backups are quick and frequent, so this is a great feature. SSD Trim support is built in, so Macrium Reflect now works even better with solid state disks, improving the performance and life. This is useful now that SSDs are becoming cheaper and more common.

Also new to version 6 is Rapid Delta Restore and Rapid Delta Clone. This claims to make restoring backups and cloning disks up to 90% faster. As I write this, Macrium Reflect is backing up the disk and it hasn't made much difference to the PC's performance. It runs in the background and does not get in the way of normal activities.

Macrium Reflect is an excellent backup utility, but it is expensive compared to similar software from other vendors.

mm Roland Waddilove

A good backup utility that creates recovery media too

GROUP TEST

Peformance CPU Coolers

Watercooling isn't for everyone, but that doesn't mean you have to settle for less if you decide to use an air cooler for your CPU.

David Hayward has been looking at six-top-of-the-range air coolers and sees which will keep low temperatures as well as being quiet when under pressure.

Peformance CPU Coolers

Be Quiet Dark Rock Pro 3

DETAILS

- **Price: £76**
- **Manufacturer: Be Quiet!**
- **Website: goo.gl/7DVywp**
- **Required spec: Intel: LGA 775 / 1150 / 1155 / 1156 / 1366 / 2011(-3), AMD: 754 / 939 / 940 / AM2(+) / AM3(+) / FM1 / FM2(+)**

This is certainly an impressive looking cooler, with an ominous black metal look throughout. And this reasonably large heatsink and fan set has pretty much everything you could ask for. The heatsink measures 150 x 137 x 163mm, weighs 1.1kg and is comprised of 90 aluminium fins mounted on a copper, machined CPU contact surface. Seven 6mm heatpipes lead from each side of the CPU contact, up through the split aluminium fins.

At the front of the heatsink, there's a 120mm Be Quiet SilentWings fan, which spins at a maximum of 1700rpm and produces noise levels of roughly 22dbA. This first section of the heatsink houses one batch of heatpipes and is broken down the middle by another fan, with a small gap between. The second fan is a larger 135mm Be Quiet SilentWings model, spinning at a reduced 1400rpm and producing a quieter 20dbA.

The two heatsink sections are joined together at the top of the unit with a brushed aluminium effect plate complete with the Be Quiet logo and 14 raised rivet-like studs. It's a decent enough looks, and in some way it probably aids the heat dissipation to a small degree.

This is a large cooler, and as a result there's naturally going to be a little interference with the surrounding memory and VRM heatsinks. However, Be Quiet has thought of this and have allowed the front fan to be mounted slightly higher, using the clips to fasten to a ridge in the heatsink. This gives just enough clearance for taller than normal RAM sticks, but any stick that tops 40mm needs to be carefully measured before you commit to buying the cooler.

Fitting the cooler is easy enough. The backplate for the rear of the motherboard is a good large plate, with an added bonus of some anti-vibration foam that fits snugly on the motherboard. There's even a set of four plastic locknuts that keep the backplate in place when you attach the posts, which make the process of fitting and manoeuvring the motherboard significantly easier than normal.

The kit comes with fittings for both Intel and AMD CPUs, and there's a tiny tube of thermal paste included as well. Overall, the fitting of the cooler went well, although it did get a little fiddly as tightening the screws while keeping the rather heavy cooler in place could have done with another pair of hands. The advised method of fitting is to turn the cooler upside down and fit the motherboard onto the cooler, instead of the cooler onto the motherboard. Naturally, since we rarely read instructions, we didn't find this out until later.

Our idle temperature was measured at 27°C and the under stress temperature at 65°C. Noise levels rarely topped the 40dbA mark, which is very good indeed.

The Be Quiet Dark Rock Pro 3 is a great CPU cooler. It's a little big, but it does a fine job and is certainly quiet enough as well.

micro mart
8 Quality
6 Value
8 Overall

The Be Quiet! Dark Rock Pro 3 is a formidable looking CPU cooler

Zalman CNPS9900-DF Dual Fan Ultra Quiet CPU Cooler

DETAILS
- **Price: £67**
- **Manufacturer: Zalman**
- **Website: goo.gl/ELuz7V**
- **Required spec: Intel: LGA 775 / 1150 / 1155 / 1156 / 1366 / 2011(-3), AMD: 754 / 939 / 940 / AM2(+) / AM3(+) / FM1 / FM2(+)**

Rather than the standard rectangular look of most CPU air coolers, the Zalman CNPS9900-DF Dual Fan Quiet CPU Cooler (CNPS stands for Computer Noise Prevention System, by the way) is an aesthetically pleasing circular shape instead.

It measures 140 x 100 x 154mm and weighs a reasonable 850g. The heatsinks are a copper-based, nickel-plated affairs attached to a highly polished, mirrored CPU contact plate. The CPU contact plate has four heatpipes that, according to Zalman, are constructed from a triple composite. This triple composite has a feature Zalman calls Sintered Metal, which increases the thermal conductivity through a capillary pumping action. Basically, it means that the heatpipes have micro-grooves engineered into them that allow the heat to pass along them in a more effective manner. To be honest, we have no idea whether this works or not, but we like the idea behind it.

The heatsink is split into two sections, with the heatpipes running through each section accordingly. There's a front 120mm fan mounted inside the fins of the first section that spins at 1000rpm, followed by a fairly large gap where there's a second 140mm fan that spins between 900 and 1400rpm. The rpm of the second fan can be controlled by the PWM option on your motherboard, and both fans are blue LED activated.

Fitting the cooler was certainly a lot easier than the Be Quiet Dark Rock. We did miss the vibration padding on the motherboard backplate, though, and the plastic locking nuts as well, but there was a lot more clearance and we could easily manoeuvre the cooler due to the fact that it is considerably lighter.

The circular heatsink of the Zalman CNPS9900-DF is striking with the blue LEDs in play

It's certainly a good CPU cooler to consider

The setup is Intel and AMD compatible, with the right fittings for each CPU model included in the package, as well as a decent amount of thermal paste. Furthermore, since the dimensions and shape of the cooler are a little smaller and different than usual, there's a surprising amount of room left available for bigger than normal memory sticks and large VRM heatsinks. And we quite like the blue LEDs as well.

Testing the Zalman CNPS9900-DF on our overclocked i7-4790K at 4.4GHz, we recorded an idle temperature of 28°C, which is only one degree higher than the Be Quiet cooler. The under stress test, of running Prime95 for 20 minutes, recorded the temperature at 69°C, slightly higher than the last test we ran on the Be Quiet model. As for noise levels, they were identical at just 40dbA.

The Zalman is a really good cooler. The CPU load temperature is a little higher than we've already seen, but only by a mere 4°C – a small price to pay perhaps for better fitting, better aesthetics and design and, of course, blue LEDs. It's slightly cheaper too, at just £67 instead of £76. In the end, it's down to what's going to work best with your system.

Noctua NH-U14S Slim U-Series

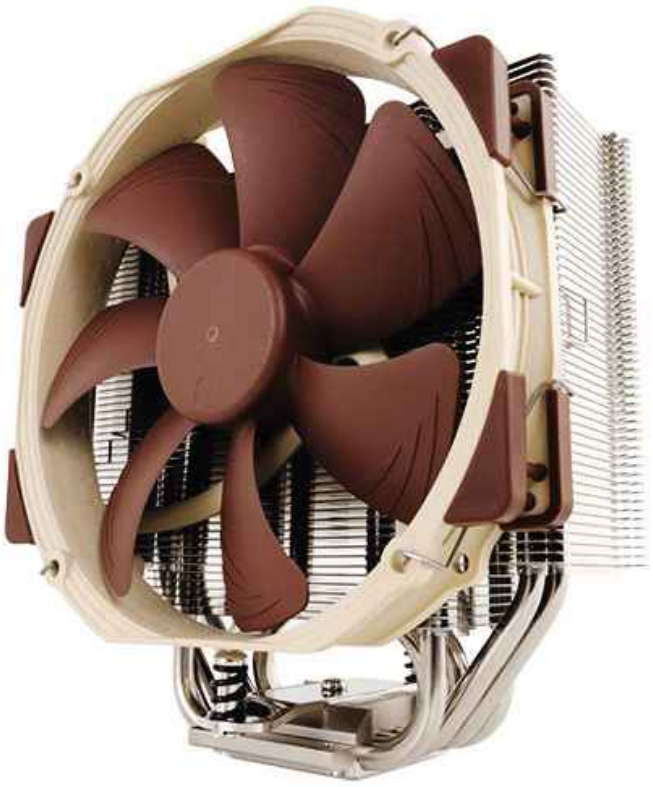
DETAILS
- Price: £55
- Manufacturer: Noctua
- Website: goo.gl/RB6gaZ
- Required spec: Intel LGA2011-0 & LGA2011-3 (Square ILM), LGA1156, LGA1155, LGA1150, AMD AM2, AM2+, AM3, AM3+, FM1,

Noctua is a highly regarded company that produces some very hig-quality products, and it has quite a catalogue of items to its name. This is one of its single-fan tower CPU coolers, and it comes with Noctua's trademark beige-and-brown, Bakerlite-looking fan and fan casing mounted onto a polished aluminium heatsink.

It measures 165 x 150 x 78mm and weighs a surprisingly heavy 935g. The aluminium fins house the six 6mm copper heatpipes that pass through to the polished copper CPU contact plate. Using a recessed section on each end, you can clip a pair of 140mm fans to either side of the heatsink. However, the kit only comes with a single Noctua NF-A15 fan, which spins between 300 and 1500rpm depending on the PWM setting on the motherboard.

Fitting the cooler is easy. The backplate fits well, although again we miss the padded area from the Be Quiet installation, and there are mounting plates and fittings for a selection of Intel and AMD CPUs, along with a tiny amount of high-quality thermal paste.

Obviously since this is a slimmer cooler than some of the other group items, there's little to no interference with the surrounding VRM heatsinks and memory sticks. We're using HyperX RAM, which isn't too big, but even with the larger memory heatsinks available, we still think you shouldn't have any problems with the fan and heatsink colliding or touching other components.



The familiar beige on brown colours of the Noctua range of products

Quality is good, but it's a little loud

The temperatures measured reflected the fact that this is a single-fan model, with less cooling surface area than the other models we've looked at. The idle temperature of our slightly overclocked i7-4790K at 4.4GHz was 39°C. Compared to what we've seen so far in the group test, this is quite high. The load temperature taken after running Prime95 for 20 minutes was 78°C, which is quite high.

The noise levels were a little louder, although not by a huge amount. We recorded 48dbA a metre away from the cooler while the fan was running at its maximum. It's not a bad volume, although more than what we've so far experienced, but it's by no means a deafening roar.

The selling points here are the great quality of the cooler and its component parts and the fact that there's plenty of room for placement on the motherboard. If you're not entirely certain you'll be able to fit the bigger CPU coolers, then this may well do the job for you. The only thing worth considering is the increased temperature and the slightly elevated noise levels.

The Noctua NH-U14S Slim U-Series costs roughly £55, depending on where you shop, so it's the cheapest cooler we've had so far in the group. It's certainly good enough for most users, under stock processor speeds at least, and the colour scheme is certainly different, if not necessarily to your personal taste. Overall, an okay choice.

Cooler Master Hyper 612 V2

DETAILS
- Price: £45
- Manufacturer: Cooler Master
- Website: goo.gl/EH45Pq
- Required spec: Intel LGA 2011-3/2011/1366/1156/1155/1150/775 AMD FM2+/FM2/FM1/AM3+/AM3/AM2+/AM2

The Cooler Master Hyper 612 V2, with oodles of technology

We can't have a CPU cooler group without at least one entry from Cooler Master, and in this case it's the Hyper 612 V2. This is obviously a remake of the original 612 cooler, which sadly we can't comment on or compare it to, because we've never used it.

Regardless, the Cooler Master Hyper 612 V2 is a large, rectangular aluminium fin heatsink block, with a single 120mm fan attached to one side. It measures 139 x 102 x 160mm and weighs a reasonable 880g.

There are six 6mm heatpipes running from the CPU contact plate and threading their way up through the folding fin design of the heatsink. The heatpipes utilise the Cooler Master CDC (Continuous Direct Contact) technology that bunches the pipes together at the CPU contact plate with no gaps to ensure a perfectly smooth surface for maximum contact and heat conduction. It's interesting actually, because the heatpipes are on the CPU contact plate, so there is, in theory, no loss of heat conduction through another layer of copper. Whether this is a more effective design remains to be seen, but on paper it looks pretty impressive.

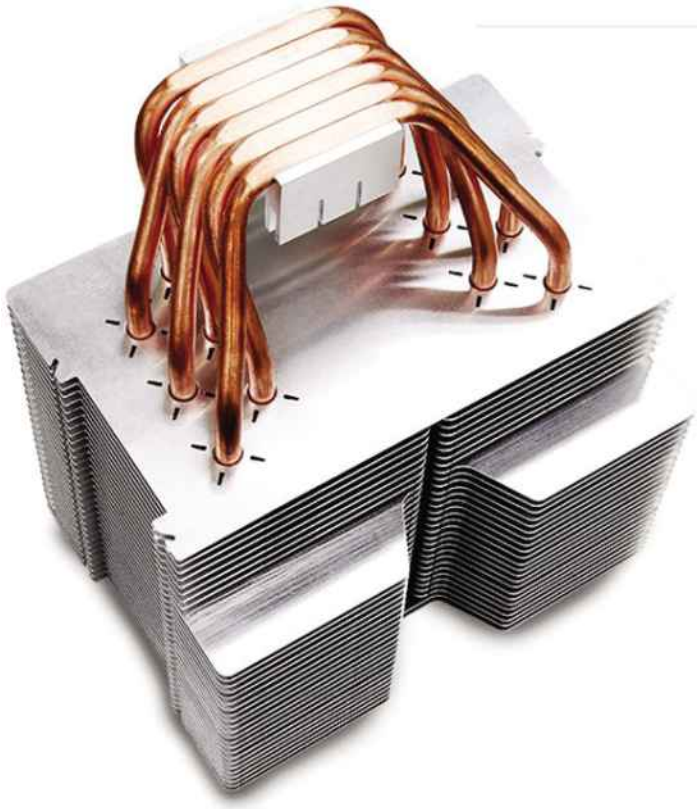
In addition to the direct contact of the pipes, where they exit via the top of the heatsink there's a small 'X' shaped vent next to each pipe. This X-Vent technology is to help airflow by creating vortices to improve the cooling and guide air over the heatpipes. Again, this remains to be proved in our tests, but it's a unique design and one we're quite interested in testing.

The 120mm quiet fan can be clipped into place on one side of the heatsink and spins at speeds of 800 through to 1300rpm depending on the PWM option on the motherboard. With the fan and heatsink technology combined, the idle temperature of our overclocked 4.4GHz i7-4790k came to 28°C. The stress tests reached a high of 79.5°C, which nearly triggered the 80°C alarm we had set on the motherboard. Incidentally, noise levels were measures at 45dbA.

The temperatures measured were quite surprising, since we got all excited over the technology we were reading about before fitting the cooler to the motherboard. Speaking of which, the Hyper 612 V2 was quite easy to install. The size of the heatsink did cause a bit of a nuisance when trying to screw the cooler down in place, and the distance between the last RAM stick and the front of the fan was mere millimetres. Still, it was in place okay and done reasonably quickly.

The cooler kit contains everything you'll need for both Intel and AMD sockets, and there's a small amount of thermal paste in the packaging as well. One note on the paste: the stuff we had was very runny, and it was lucky we squeezed it on while the motherboard was in a horizontal position,` as it would have quickly run off and over the surrounding components.

We were expecting better from Cooler Master, to be honest. The Hyper 612 V2 is an okay cooler, but we weren't all that impressed with the numbers from our tests.



We were expecting better results, though

> **"We were expecting better from Cooler Master, to be honest"**

Cryorig H5 Universal

DETAILS
- Price: £39.99
- Manufacturer: Cryorig
- Website: goo.gl/g4qu71
- Required spec: Intel LGA 2011-3/2011/1366/1156/1155/1150/775 AMD FM2+/FM2/FM1/AM3+/AM3/AM2+/AM2

We haven't used a Cryorig air cooler before, so we were looking forward to putting the H5 Universal through its paces.

It features the usual rectangular heatsink design, but Cryorig has added something a little different to the mix, in that the H-Series of coolers incorporates a Hive Fin design structure. This means that rather than the standard horizontal fins of the heatsink as we normally see, the H5 has a honeycomb effect through its 38 aluminium fins. This is supposed to exhaust hot air faster and more efficiently than conventional methods.

Added to this are four 6mm pure copper nickel-plated heatpipes that carry the heat up from the CPU contact plate and through the intricate honeycomb heatsink, to emerge in the large surface on top for extra cooling properties. There's also a decent 140mm PWM fan with spin speeds of 700 through to 1300rpm. Incidentally, the fan has rubberised acoustic mounts to help cut down on vibration and noise levels.

The entire cooler measures 98 x 143 x 160mm and weighs around 850g. It's extremely easy to fit, taking just ten minutes and comes with mounting plates and fittings for both AMD and Intel sockets – hence the Universal part of the title. It's also quite slim and raised enough off the CPU socket to allow plenty of room for any make of RAM stick. There's also room for the surrounding components as well.

The Cryorig H5 Universal proves to be a great CPU cooler

> "One of the cheapest coolers here and one of the best"

Once fitted to our test machine, the idle temperature of the overclocked 4.4GHz i7-4790K was a decent 30°C. Under load, the temperature measured was 66°C – just one degree higher than the Be Quiet cooler. One aspect, though, where the Cryorig H5 Universal did come top of the leaderboard was in the noise levels, with a whisper quiet 39dbA.

There's a lot to like about the Cryorig H5 Universal. It proves itself against a dual fan cooler more than well enough, the clearance is really good, it's easy to fit, and it's the quietest cooler we've tested so far. But there's one more thing we really like about this cooler. The Cryorig website has an origami print and cut out template that you can download for the socket of your choice. All you need to do is print out the PDF, and once you've cut along the marks and folded it into shape, you can dry-test the size of the cooler on your own board before committing to buying it.

The honeycomb design obviously works well with just a single fan

And if you are interesting in making a purchase, the average price is roughly £39.99, which makes this one of the cheapest coolers here and one of the best we've had the pleasure of testing in a long time.

Xilence M606

DETAILS
- Price: £39
- Manufacturer: Xilence
- Website: goo.gl/pFxwOH
- Required spec: LGA1366/LGA1155/ LGA1156/LGA775, FM1/ AM3+/AM3/AM2+/AM2

Our last entry in the group is a Xilence M606. It's a fairly standard design, with the aluminium fins of the heatsink in a horizontal arrangement, with a 120mm Xilence 2CF silent fan mounted on one side. It measures 136 x 84 x 156mm and weighs a rather hefty 1.2kg.

There are six 6mm heatpipes that run from the copper nickel-plated CPU contact plate and up through the fins of the heatsink. Sadly, there's no magical heat dispersion technology in use here, just the standard large surface area to get rid of the heat from the CPU.

The cooler is reasonably slim and able to fit on top of the CPU without too much interference with the surrounding components, although those with very large memory heatsinks on the RAM sticks and motherboards with large VRM heatsinks may need to check beforehand.

Fitting it was easy. There are mounting brackets and other fittings for both Intel and AMD sockets and a tube of thermal paste thrown into the box for added measure. It's a fairly straightforward and nondescript setup and one that only took about 15 minutes – there were a few tricky screws in place for our sausage-like fingers.

The Xilence M606 is standard design that doesn't offer too much

In testing, on our overclocked 4.4GHz i7-4790K the idle temperature was measured at 38°C, making it one of the highest so far at idle. The load test didn't prove much better at 75°C, being only four and A half degrees cooler than the hottest we've had the processor running at.

Noise levels, meanwhile, were quick shocking. We're not sure if it was a problem with the fan we had or just something with the M606 itself, but we measured a rather loud 55dbA at one metre from the cooler. It may not appear a lot of difference on paper, between the 48dbA of the Noctua entry and this cooler, but it makes for a noticeably louder setup – especially if you're building a system where you want to limit the amount of noise produced.

> **"The noise levels produced will more than likely turn users away"**

Although it wasn't the hottest cooler we've had running, it wasn't particularly good at either the idle or load tests. And the noise levels produced will more than likely turn users away in favour of the far quieter models we've already looked at. Tthe Xilence M606 about a pound cheaper than the Cryorig entry, but you're better off spending the extra pound for a far superior cooling solution.

The noise levels are the loudest in the group, and it's not that great at cooling either

There's not much left to add about the Xilence M606. It's a pretty bog standard cooling solution, sadly with not a huge amount going for it. As we've seen, there are better options available, even if you require the extra room to fit a more elaborate memory kit with larger than normal heatsinks attached.

Cryorig H5 Universal

We felt that the Cryorig H5 Universal offered the best all round cooling and noise levels of the group. Combined with the cost of the unit, it's a winner

Be Quiet Dark Rock Pro 3

Although it's the most expensive cooler of the group, the Be Quiet Dark Rock Pro 3 is an excellent dual fan cooler.

How We Tested

Each cooler was fitted to a Gigabyte Z97M-DS3H with an overclocked i7-4790k processor at 4.4GHz. The idle temperature was measured by HWMonitor at idle, from booting to resting at the desktop with no programs opened for 20 minutes, and under stress with Prime95 running for 20 minutes.

	Be Quiet Dark Rock Pro 3	Zalman CNPS9900-DF	Noctua NH-U14S Slim U-Series	Cooler Master Hyper 612 V2	Cryorig H5 Universal	Xilence M606
Price	£76	£67	£55	£45	£39.99	£39
Socket Compatibility	Intel/AMD	Intel/AMD	Intel/AMD	Intel/AMD	Intel/AMD	Intel/AMD
No Of Fans	2	2	1	1	1	1
Measurements	150 x 137 x 163mm	140 x 100 x 154mm	165 x 150 x 78mm	139 x 102 x 160mm	98 x 143 x 160mm	136 x 84 x 156mm
Weight	1.1kg	850g	935g	880g	850g	1.2kg
Thermal Paste Included?	Yes	Yes	Yes	Yes	Yes	Yes
Idle Temp	27°C	28°C	39°C	28°C	30°C	38°C
Load Temp	65°C	69°C	78°C	79.5°C	66°C	75°C
Noise Level	40dbA	40dbA	48dbA	45dbA	39dbA	55dbA

Your Letters

In Defence Of Facebook

Why is that Facebook gets such a bad rap? I'm not referring to the problems regarding its use of our data or privacy concerns. I'm talking about people complaining about what it does and what it's used for, or moaning about advertising.

I really don't understand the problem some people have with it. Facebook is a service that allows you to easily communicate with your friends and family in an easy-to-use forum, where you can post pictures and videos too.

Of course, it's better to talk to people in person but that's not always possible, and phoning them is more intrusive. With Facebook, they can reply whenever they like.

Some people say we got on just fine without Facebook so we don't need it now. Well, I say we survived for centuries without computers too, but who'd give those up now?

Thanks to Facebook, I'm able to easily keep in contact with old friends, who I might not otherwise hear from. Before we had social networks, these kinds of friendships would just have faded away into nothing.

So I say Facebook is a wonderful thing, and it's free, so people should be grateful that.

Ken Avis

Mac To Basics

Back in the day, I used to love spending ages building PCs and tweaking them, but these days I don't have time. So I thought I'd make life a bit easier for myself by buying a Macbook.

Everyone told me how easy they are to use, how they never crash, don't get viruses and so on, so I thought what the hell I might as well give it a go.

I really wish I hadn't.

Yes, the operating system works well and is easy to use, but since I updated it to the latest version, Yosemite, it's just been crashing left, right and centre.

Okay, maybe that's an exaggeration. For the most part it works, but at least once a day, it will just decide it doesn't want to do anything and will just refuse to load or close any applications. I can still type into the web browser and look at web pages, but I can't use the Finder at all. It just refuses to budge.

I paid a thousand pounds for this stupid thing and I really don't feel like it was worth it.

On the plus side, they keep their value, so I could get most of my money back on eBay. I just don't know if I could subject someone else to this kind of misery. I'd feel too guilty and I'd probably just give them a refund.

In future, I'll be sticking to regular PCs, thank you very much.

Tony Price

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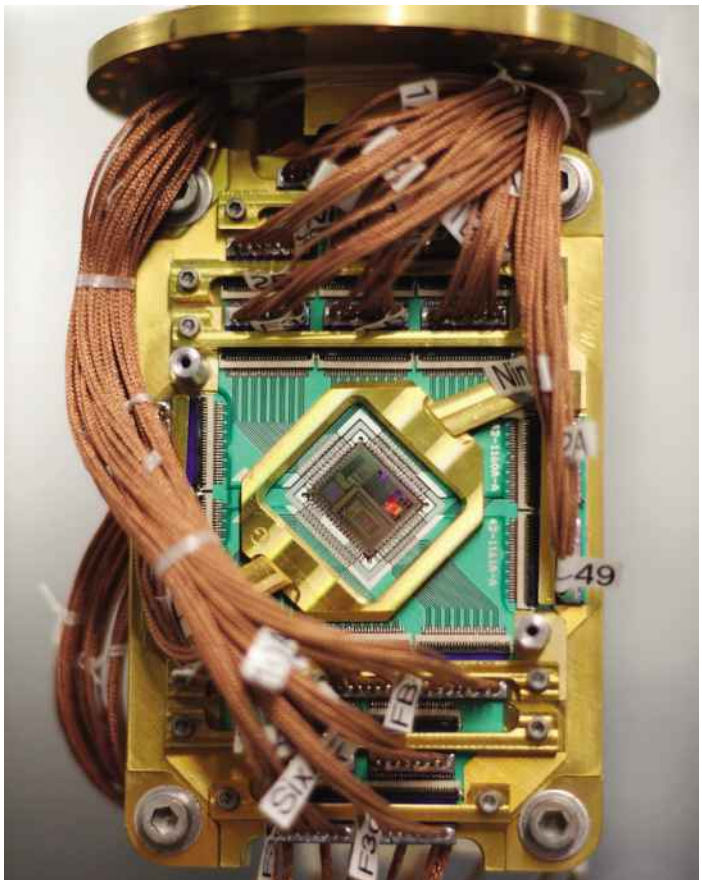
What Can We Expect From Quantum Computing?

David Hayward simultaneously tries and fails to understand quantum processing at the same time

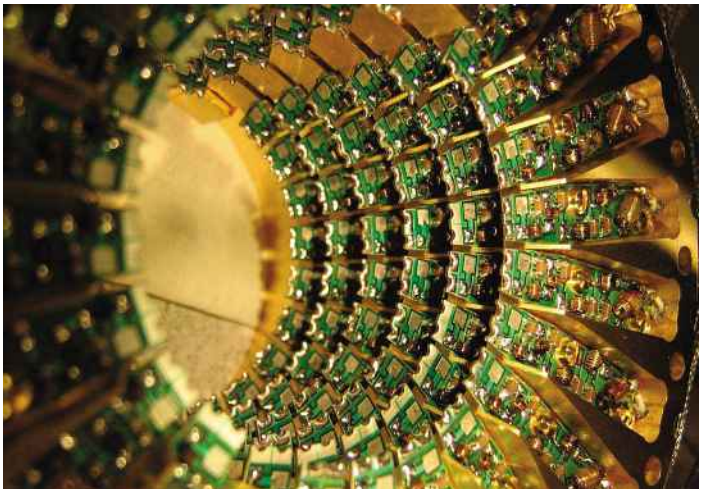
It's an amazing thing that in our lifetimes, we will have witnessed the birth of the home computer, its evolution to more powerful and more amazing handheld devices, through to the inevitable invention of the first personal, desktop quantum computer. At least that's what we think may happen.

The quantum desktop computer is still quite a way off. There are examples of quantum processors being used for small experiments, usually in universities around the world. Some companies are also using the first generation of quantum computers for big number experiments and to see just what advantages a quantum computer has over a more traditional super computer.

D-Wave Systems Inc., for example, created the D-Wave quantum computer as more of an experiment in computing rather than something Nasa would use to discover new planets beyond our own solar system. The D-Wave 1, as it's now known, used a SQUID,



^ *This is either a Flux Capacitor or a D-Wave quantum processor*



^ *A mind-blowing array of qubits*

a superconducting qubit or quantum transistor that uses different voltages to encode two states called +1 and -1 as minute magnetic fields that can either be pointing up or down. The qubit can then take these states and use quantum mechanics to access the states to be either, in binary computing terms, 0, 1 or 0 and 1, or all of them at once.

If you're still with us, and we won't blame you if you're not, D-Wave 1 had a 128-qubit chipset, which when fully used under quantum mechanical states turned out to be several times faster than a traditional super computer. Now, though, D-Wave Systems has the D-Wave 2 and boasts a machine that has just recently (June 22nd) broken the 1,000-qubit barrier with a quantum processor that has 1,152-qubits. In terms of speeds, this makes the D-Wave 2 about 300,000 times faster than D-Wave 1 and pretty much 4,000 times faster than a super computer cluster.

We won't get into how quantum mechanics work at this point in time (or maybe we will and won't at the same time), but suffice to say it's pretty weird stuff. What we're interested in is what exactly we could expect from a quantum computer. What can it do for us? Will it be able to play *Crysis* in 4K without any signs of lag? Will it forecast next week's lottery numbers? Well, we did some intense research (read: we Googled it) into what the quantum desktop computer will bring to our homes.

0, 1 And 01 Or 10... Or Something...

We obviously don't have quantum desktop computers yet. In about 15 years' time, though, we probably will, so what will happen when we boot up Windows 99 with our quantum mechanical PC?

Dilbert explains quantum computing best

Gaming

The theoretical power behind a quantum computer will allow enormous numbers to be calculated in fractions of a fraction of a second. Really fast, in other words. Gaming therefore, is basically lots of mathematical numbers being represented in a graphical form – more or less.

To compute and draw a mountain and the background of the game and still allow the player to walk up to that mountain many miles away while being able to grind out all the other data and environmental factors takes some processing power. That's why the latest, biggest games need some serious PC performance.

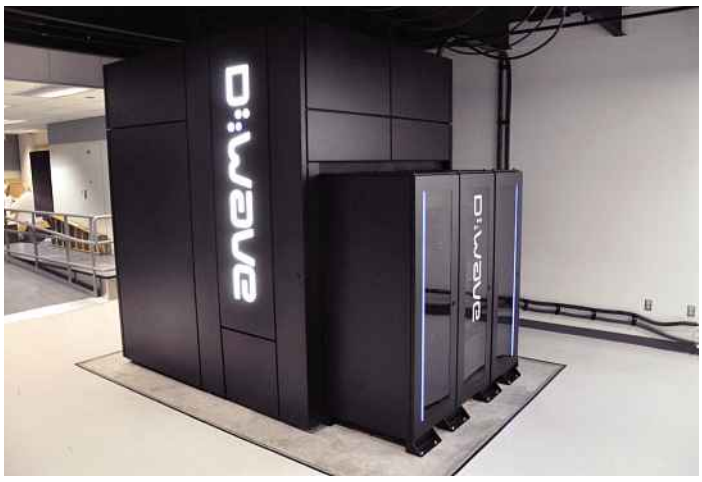
There are other factors in use with a gam,e though, but since they all work around a processing unit, be that CPU or GPU, then a quantum processor or QPU will naturally be able to do those things faster, using less power and with less heat generated. This will, in the theory of others, lead to games where entire universes are generated for a player to wander around.

Science

Moving away from the theoretical quantum desktop PC for the moment, institutions and companies such as D-Wave are already using quantum computers to enhance drugs and to combat diseases and cancers.

The vast computing power in a qubit can manipulate amino acids into all manner of enhanced drugs to help medical research. Researchers from The Scripps Research Institue (TSRI) have, through the use of a quantum computer, created a new class of drugs called Senolytics. What these new drugs will do is effectively slow down the aging process in humans, which in turn will treat age-related illnesses.

It doesn't mean Walt Disney, who we all know is secretly cryogenically frozen in some deep underground vault, will suddenly rise from his frosty grave thanks to quantum-inspired drug programmes. But it does mean that, as TSRI puts it, the human lifespan could be more than doubled in the next 20 to 30 years.



Nasa's D-Wave 2 quantum computer

D-Wave Systems

D-Wave Systems is quite an impressive company. If you want more information on what we mentioned here regarding the D-Wave 1 or 2, then visit **dwavesys.com**.

Similarly, if you want to know how the D-Wave hardware actually works, then have a read through the Introduction to the D-Wave Quantum Hardware at **goo.gl/1BmS6H**.

Also, if you want to read more about the quantum universe and whether it's real or we're real or not, then get a hold of a copy of *Decoding Reality* by Vlatko Vedral.

And for more quantum computer knowledge, we recommend the Centre for Quantum Computation's papers at Cambridge University at **goo.gl/2k3uYz**.

Space Stuff

NASA boffins are regularly using quantum computers to help shift through the vast amounts of data obtained from the many telescopes in orbit and around the globe. This wealth of data is being used to help identify new planetary systems and other Earth-like planets.

Also, Nasa is conducting experiments, in computer controlled environments, for the next generation of space propulsion. Using quantum computers to help maintain the environment and measure the output of the experiments mean Nasa can build more efficient and effective propulsion technologies to help send people off to Mars.

CERN

The Large Hadron Collider deals with some pretty big numbers. Every second a petabyte of data is created when they send a couple of tangerines around the LHC under the Swiss countryside.

To help crunch these numbers into something manageable, the scientists at CERN use quantum computing to spot the unpronounceable list of God-Particles that cause them to go all giddy with joy. It's fascinating stuff, although a little headache inducing.

Virtual Reality Or The Matrix?

Back to our theoretical quantum PC. *New Scientist* looked at whether our universe is actually a quantum computer routine running in some sort of Matrix-like super-quantum computer.

Decoding Reality by notable physicist Vlatko Vedral delves deeper into this theory and supposes that the quantum computer of the next generation of users will be able to construct entire universes, complete with billions of individuals and trillions of life forms in a virtual reality setting.

From our point of view, gaming would be beyond words , but also historians could accurately recreate moments in history. Fancy witnessing Pompeii, anyone? Or perhaps the first moments our ancestors crawled out of the primordial soup? According to Vedral, all this will be possible and could already be the reason why the universe exists and explains the fact two matched qubits will always be in the same state no matter what distance separates them.

Brain-ache

We're off to soak our heads in a bowl of cold water now, but before we do we'll leave you with this snippet from the Institute of Advanced Studies:

"If one particle can be described by two variables, then to describe the most general state of n particles, we need 2n variables. If we have 100 particles, we need 2100 variables, which is roughly 1 with 30 zeros."

Which is why we need quantum computing. **mm**

The Pirate Bay Not Gone Yet

Mark Pickavance looks at the Pirate Bay, and tries to explain how it still exists, regardless of what actions are taken against it

Every news story about piracy always mentions The Pirate Bay, like it really needs any higher profile. Given how long this hub for illegal file distribution has existed and the number or organisations bent on its destruction, it's still with us. How is this possible?

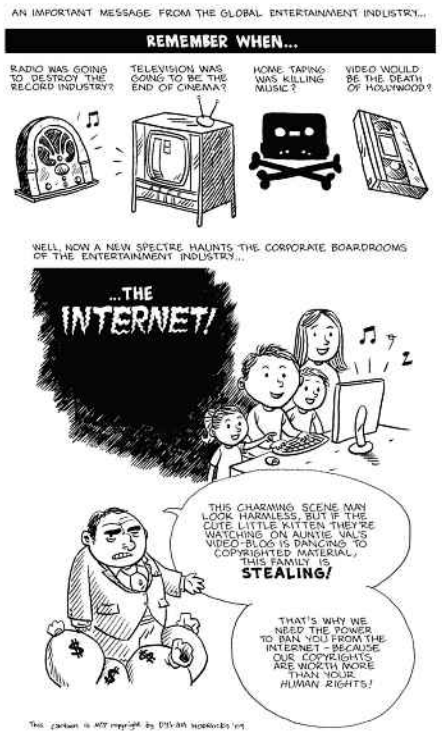
A Brief History Of Piracy

With so many people trying to shut it down, you might be shocked to discover that The Pirate Bay has been around for 12 years. Initially it was the public face of a Swedish anti-copyright organisation called Piratbyrån (The Piracy Bureau), but it soon became an independent entity and a *cause célèbre* for those who pursue copyright infringers.

It took three years for action to be taken by the MPAA (Motion Picture Association of America), which managed to get the Swedish police to raid The Pirate Bay offices in May 2006 and arrest those running the site. It also took possession of the servers, even though this actually only caused a total of three days' downtime, after which new ones reappeared in Finland.

However, the four individuals that were held in the aftermath of the raid were eventually (some three years later) handed

Carl Lundström, whose business is Crispbread, backed right-wing politics and the Pirate Bay



A cartoon that highlights that not everyone is on the side of the copyright holders in their fight against sites like the Pirate Bay

short prison sentences alongside fines in excess of £2.8 million. On appeal the prison time was reduced but the fines increased by 50%.

The best known of The Pirate Bay four was Carl Lundström, heir to a crispbread brand fortune and supporter of far-right politics in Sweden. He owned the company that hosted the site and was a major financial supporter of The Pirate Bay in the early days. Yet even these legal entanglements didn't stop the site, and it continued along with a collection of associate locations including KickassTorrents and ISOHunt.

What made this period notorious was that you could search for illegal torrents using Google, which at the time indexed the entire site and others. Wisely seeing this as part of the problem, content owners started to demand that Google remove their material from the index, so it couldn't be easily found.

In fact, Google's fielded more than 80,000 requests for link deletions, many of which it complied with without any great proof that either the content infringed copyright or that the takedown notice was completed by the true copyright holders. This caused some consternation among the management of the firm, some of whom have said on record that they don't believe in tailoring freedom of speech for specific locales, as they see it as the thin end of a wedge that ends up with wholesale censorship.

Meanwhile, in an attempt to avoid the domain being seized by the USA, The Pirate Bay moved from the domain **thepiratebay.se** to **thepiratebay.org**. Then, fearing seizure by Swedish authorities, it became **thepiratebay.gl** (Greenland), before going back to **thepiratebay.se**.

The second big raid took place in 2014 in Stockholm, with the servers being seized after the police received a complaint from the Rights Alliance, a Swedish anti-piracy group. In response, the database of the original site cropped up on numerous other locations, before a tool called The Open Bay was released, which allowed users to build their own version, spawning more than 400 mirror sites in a relatively short time. While the content replicated, it took just 13 days for **thepiratebay.se** to return officially, and it's now hosted by an ISP in Moldova.

> **“After numerous injunctions, arrests, fines, convictions and multiple raids, the internet location and its dubious trade marches on”**

Therefore, after numerous injunctions, arrests, fines, convictions and multiple raids, the internet location and its dubious trade marches on. Thus, having failed comprehensively in shutting the site down, those on the copyright content warpath explored other avenues of redress.

Blocked

With the legal attempts in Sweden either not succeeding or not having the desired impact, content owners set about trying to cut the public off from the site rather than the site from the public. From as early as 2005, some countries started demanding that their ISPs block access to the site for their customers.

For your interest, I've listed in a box the 28 sovereignties that have blocked access to the site, though probably more interesting are those that aren't included, specifically the USA. It's also worth pointing out that China only blocked access briefly in 2008, and for the majority of the mainland (though not Hong Kong and Macau) it's fully accessible.

Likewise Australia is discussing banning it, but hasn't actually put a block in place yet. The Norwegian ban ran into a legal hurdle it has failed to cross, and Austria's ISPs have failed to implement a block without getting specific domain name instructions. Obviously, the judiciary generally waving in the direction of Scandinavia and mumbling 'Pirates' wasn't considered concrete enough for them to act.

The UK situation is, thankfully, less ambiguous. Since 2012 and a High Court ruling asserting that The Pirate Bay facilitates copyright infringement, Sky, Everything Everywhere, TalkTalk, O2 and Virgin Media have been compelled to block access to The Pirate Bay. BT resisted the court's instruction initially, though it has since chosen to enforce a block.

Despite these changes, after a brief dip, P2P traffic is now at the same level or higher than before the ban came into force, and information circulated within hours as to how these ISP-level blocks could be circumvented.

Politicians seem naive enough to accept a tickbox mentality that said: once blocked, this problem was fixed. It patently isn't, though, and there are no signs that any of the ISP-level efforts have had any substantial impact. Also, it's been noticed by those that track traffic that each time a major news story breaks announcing that The Pirate Bay's days are numbered, traffic to the site actually increases, as more people become aware of what it is and where they might find it.

The film industry itself has, ironically enough, spent lots of money trying to convince the filmgoing public that pirates are fun and amusing

Why Is This So Difficult To Stop?

What has confused people from the outset, often those in the legal domain, is that The Pirate Bay doesn't contain any illegal files whatsoever. No, those exist only on the users' machines, and The Pirate Bay acts as an electronic mediator to connect those who have files and those who want them, using the BitTorrent distribution technology.

It might be nuanced, but legally the difference between holding stolen goods and telling people who come by where they can find someone who has them is a very different proposition. In the same way, you can use Bing and Google to find torrent sites, making them unwilling accessories of sorts.

It's also worth pointing out that while the access to The Pirate Bay is blocked at an ISP level in this country, in many others around the world it isn't. That's because the media industry doesn't have leverage in those locations, or it would be considered as censorship, so their leaders refuse to clamp down. Yet even in those countries that have ISP bans in place, you can still access this (and other banned sites), because those who devised the means by which they're blocked appear to understand very little about the internet and how it actually works.

All you need to do (and, no, this isn't meant as information to help potential pirates) is access the site either through a proxy that isn't banned at ISP level or via a country that hasn't implemented any sort of lockdown.

Those who support The Pirate Bay have been very good at creating new domains, pointing them to The Pirate Bay servers and then telling everyone what these new location names are. After a while, someone in the media industry goes to court and has these banned, and more are created, like an endless game of chase-me, where those trying to stop the site are always behind the curve, often considerably. With this lack of results, some in the media business want a more heavy-handed approach like that taken with international terrorists.

That has been tried, however, and it didn't work out that well.

Dotcom Disasters

There's a view that asserts the only way to really stop The Pirate Bay is to arrest all those involved and take possession of the servers, as they did with Kim Dotcom's Megaupload. However, that example demonstrates how wrong this can all go.

In 2012, Kim was arrested by New Zealand Police at the behest of the US government and the FBI, and charged with copyright infringement that ran into half a billion dollars, yet three years later he is still free. What's more, a catalogue of mistakes made both by the US agencies and New Zealand police have been detailed by his legal team, causing much embarrassment.

As it turned out, the warrants used to seize Kim's property were too broad, and the New Zealand security services had spied on a permanent resident (against their constitution) in order to gain information. Also, the FBI had agents involved in the raid even though they had no legal jurisdiction or basis for acting on foreign soil. And they subsequently copied drive data and sent it to the US without getting legal permission, breaking extradition laws. To cap it all, data on the MegaUpload servers was destroyed without reference to its owners, regardless of its legality or not.

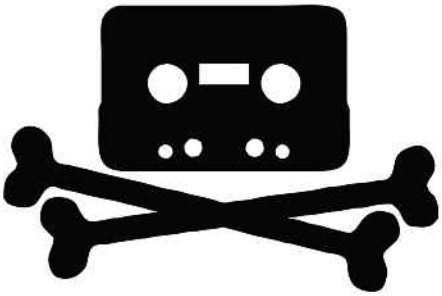
Due to this and other legal wranglings, at this time the US is still trying to extradite Kim Dotcom. Realistically the chance of this happening seems increasingly slim. The farcical antics of those in the New Zealand agencies, as well as the close political connections between Prime Minister John Key and those directing this from the US, have managed to damage their collective standings immeasurably. The whole exercise has demonstrated that, unless the USA is prepared to abduct people using the CIA and then render them to friendly territory as if they were terrorists, the will to chase alleged infringers around the world at the behest of copyright holder is no guarantee that they'll succeed in stopping them.

Final Thoughts

What those in the copyright protection game seem inclined to rapidly forget, while they're busy foaming at the mouth about the supposed billions in lost sales, is that The Pirate Bay exists because numerous people want it to. When that support is eventually removed, then naturally it will disappear, like wax drums did when the vinyl record arrived.

Those who use The Pirate Bay do so because they either can't afford to pay, choose not to pay for whatever reason or what they want just isn't available. The Pirate Bay supports a particular demand that isn't being met elsewhere, for wrong or right. Historically, the popularity of the original illegal torrent sites was fuelled by the media industry itself deciding not to provide alternatives, and they're still not doing so.

A good parallel to this is how prohibition in America in the 1930s was meant to reduce crime and the other evils linked to alcohol, but actually it placed a vast money-making machine into the hands of organised



The Kim Dotcom estate in New Zealand was stormed by local police and US agents, none of whom had the proper legal justification to be there

crime, which used that gift to propel itself into new criminal ventures and expand into entirely legal businesses – a legacy that America is still dealing with today.

Moving forward 90 years, and booze is now films, TV and music, and the speakeasy has become the rogue torrent site – and, just like the majority of the drinking public of America in prohibition, those that use these places don't consider themselves to be criminals in spite of Hollywood's perspective on the matter. The parallels are striking, but what can we learn from what happened then?

Well, depressingly for the content industry, despite Elliott Ness and the Untouchables, the speakeasy world only went away when prohibition was ended. Once you could buy a beer or a whiskey legally, the market for illicit booze disappeared overnight, and organised crime switched focus to other still illegal activities like prostitution, protection rackets, illegal gambling and eventually drugs and e-crime.

Using prohibition as a model, people won't stop freely distributing content until you can legally download a movie the weekend it comes out and at a price that most could reasonably afford. That's the magic bullet to stop The Pirate Bay, though the film and TV industry seems determined not to load that ammunition, no matter what damage they think is being done to them and their industry.

What's worth noting is that this is an industry that's fought change all the way. It tried to make it illegal for made-for-cinema movies to be shown on TV before a period of at least five years. It even famously attempted to have it made illegal to sell a VCR in the USA during the late 70s – a tactic that, as it turned out, would have cost the movie industry billions had it succeeded.

> **"Nothing the collective might of the copyright industry has done so far has come close to closing the Pirate Bay"**

In that world we'd still be seeing the same Disney feature animations come around every seven years at the cinema, because that would be our only chance to see them, and we'd still be watching Pierce Brosnan as James Bond on TV. In terms of commercial choices related to new technology, the industry has a track record of making the worst ones if given the opportunity.

Now it's irrationally trying to whack-a-mole The Pirate Bay, blithely ignoring the success of its distribution system and model, when embracing the technology and attempting to offer the public what they actually want (at the right price) could serve it better. That would certainly be better than indirectly supporting The Pirate Bay and its kind through lack of innovation.

The music industry went through a similar thing during its 'suing elderly people for listening to downloaded thrash metal' phase, and it didn't work out well. There were too many infringers, and it seems that many of them were also the industry's biggest backers – the same people that were also buying records, gigs tickets and merchandise.

Latterly, record labels developed a blended model where you can digitally buy tracks rather than whole albums, or use all-you-can-eat streaming services like Spotify. With Amazon and Netflix offering a next-generation platform for visual media, it's time for the film industry to grasp this new opportunity and choose to sell its product to billions at a small income per view instead of a much smaller audience at a higher price.

Failure to learn is dangerous, because nothing the collective might of the copyright industry has done so far has come close to closing The Pirate Bay. **mm**

Countries Currently Blocking The Pirate Bay

1 Argentina
2 Australia
3 Austria
4 Belgium
5 China
6 Denmark
7 Eastern Europe
8 Finland
9 France
10 Germany
11 Greece
12 India
13 Indonesia
14 Ireland
15 Italy
16 Malaysia
17 Netherlands
18 Norway
19 Portugal
20 Qatar
21 Russia
22 Saudi Arabia
23 Singapore
24 Spain
25 Sweden
26 Turkey
27 United Arab Emirates
28 United Kingdom

VPNs Worth Considering

David Hayward has a look at three excellent virtual private networks

We've seen a lot in the media over the last few years regarding privacy (or lack thereof), hacking and spying. The idea of government agencies spying on your browsing history or tracking your every movement is the stuff of conspiracy theories and Hollywood movies. Or is it?

It's been made blatantly clear that elements within the major political powers have the ability and actually are snooping on the population. The old saying of "I'm not doing anything wrong, so they won't look at me" simply doesn't apply. This is our privacy and it's our right to have it.

The answer to successfully covering your internet usage is through a good virtual private network (VPN). A VPN will hide your actual IP address and show it as one from another country, if needs be, or from your country of origin. It'll also allow you to access content that has been otherwise blocked in your country, and it'll allow you to browse another country's services that are unique to them and not to you.

There are nefarious uses for a VPN client, the main one being illegal downloads, but that's a discussion for another time. What we want to briefly look at here are a few of the better VPNs that are currently available and what they have to offer. Remember, this is purely based on privacy and the ability to browse freely.

HMA!

Hide My Ass! VPN, despite its colourful name, is an impressive service that offers a list of features that's difficult to match and is one of the largest and most comprehensives VPN services available.

HMA VPN's strength lies in its infrastructure. With a total of 870 (at the time of writing) servers located in 320 locations throughout 200 countries, HMA has an impressive market presence in the VPN industry.

It's available on a paid-for only plan, with no free usage so far, and when compared to other VPNs it can appear a little expensive. However, you do get one of the best VPN services for your money. There are three plans available: one month at $9.99 (£6.35), six months at $6.99 (£4.45) and one year at $4.99 (£3.17), all per month. The price plans can change, and there's a deal on at the moment, so that will affect the current overall cost.

There are many features that make HMA such a good service, including the Country Selection Tool, On-Demand IP Switching, Timed/Randomised IP Switching, Smart Server Load Balancing, Speed Guide and Speed Testing and the Secure IP Bind.

The Country Selection Tool will change your IP address location to one of the 59 countries where the servers are housed. On Demand and Timed IP Switching will allow you to change IP addresses (from HMA's 117,770 IPs available) at a click of a button or every few minutes depending on your selection. The Smart Server Load Balancing will automatically hop you from one server to the next less used server without any noticeable drop in bandwidth. Similarly, the Speed Guide and Testing will check your connection and find the closest, fastest server for you to attach to.

Finally, the Secure IP Bind feature will automatically start any application you specify through the HMA VPN client and stop the program from launching if, for some reason, the client isn't active. This way, you can prevent any program from connecting to the world without first going through the VPN.

CyberGhost

CyberGhost is by far our favourite VPN. It's fast, perfectly secure, unrestricted in any way, easy to use and is available for just about every platform.

CyberGhost has created a web of proxies all over the world – over 480 secure servers, all of which comply to the highest AES encryption models and offer a total bandwidth of over 23Gbps. What's more, there's also a free proxy plan as well as the usual pricing plans available.

The annual Premium subscription plan, which allows you to use one instance of the client, costs just £1.87 per month. The Premium Plus plan, which allows you to use the client on up to five different devices, costs a mere £5.83 per month.

HMA! is a good all-round VPN service

CyberGhost is, in our minds, the best VPN currently available

PureVPN is expensive, but otherwise good enough for anonymity

You get unlimited traffic, an anti-fingerprint system, encryption, unlimited bandwidth, unrestricted use of any of the servers across the world and the peace of mind that your connection is being filtered through a company that's as passionate about security and privacy as you could possibly get.

We've used CyberGhost for a number of years here at Micro Mart, and it's never caused us any problems or dropped connections. Our 75Mb BT connection only drops in speed slightly when CyberGhost is active, making it the fastest VPN we've used.

You also get a free anonymous proxy browser that works directly from the CyberGhost site, at **goo.gl/zUb73S**, with the option to choose from different countries of origin and to block cookies, remove scripts and remove objects if necessary. And as with the main client, all transactions and traffic are secure, never logged, and you can even pay via BitCoins for extra anonymity.

CyberGhost is a complete anonymity package that we think is head and shoulders above the rest.

PureVPN

PureVPN is very similar to HMA! in terms of the number of servers, countries used and users.

A one-month plan will set you back $11.95 (£7.91), six months will cost $71.70 (£47.73), and the 12-month plan costs $143.40 (£94.93). It's not the cheapest set of options going, but there are usually some discounts posted for a few percent off, so it's worth checking out from time to time.

What you get for your money is a good package of security and privacy, which incorporates all the usual hidden IP address functions, unlimited country specific server logins, unlimited data transfers, 256-bit military grade encryption on all communications, a three-day money-back guarantee and 24/seven technical support.

PPTP, L2TP/IPSec, SSTP, OpenVPN and IKEv2 protocols are all supported and can be further configured within the settings of the client software or simply left alone to automatically switch when necessary. It's also worth noting that PureVPN has covered all the operating system bases as well, with a client for Windows, Mac, Linux, Android, iOS and even Windows Mobile devices.

The UK-based servers were reasonably quick – nowhere near as quick as CyberGhost, but generally good enough for viewing content.

> **"This is our privacy and it's our right to have it"**

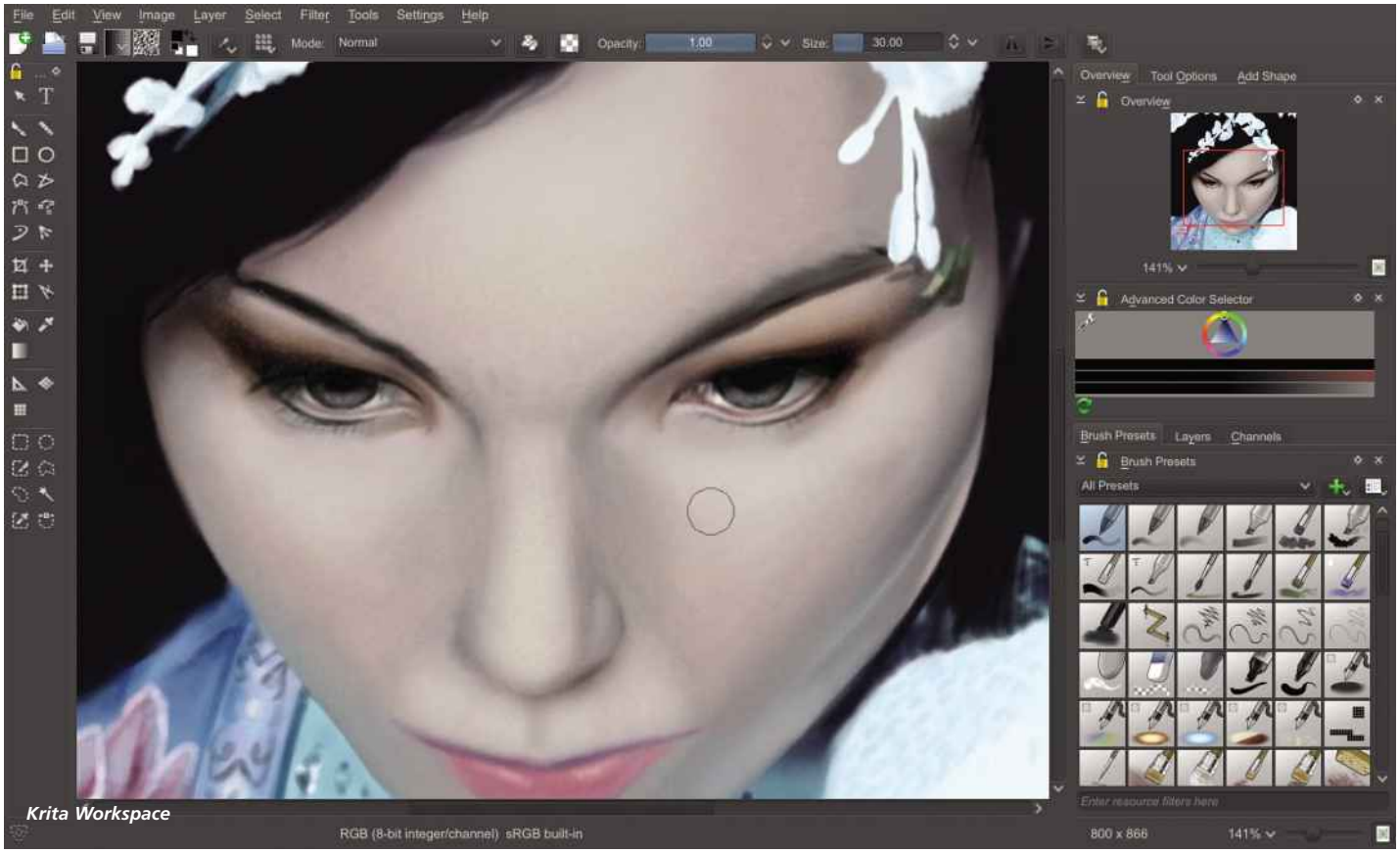
In terms of other functions, PureVPN does a pretty good job of delivering as much as could be expected, but there is rather a lot to take on board at first, and from the point of view of the newcomer it can be a bit confusing. For example, you'll have to enable the SMTP portion of the service before you can send and receive emails via an email client, which involves contacting PureVPN and telling them your email specifics.

As for logging, PureVPN do not log any content, only the bandwidth usage, and it does not give out any details of the usage to any third party unless it's ordered to by a court of competent jurisdiction. **mm**

What Can You Use A VPN For?

Just to recap, as we've mentioned VPNs many times in the past, a VPN can help you:

- Become anonymous online.
- Gain access to content in other countries.
- View otherwise IP and country specific banned content.
- View TV channels from other countries.
- Retain your privacy while online.
- Stop specific IP attacks from reaching you.
- Safer browsing on mobile devices or at coffee shops etc.
- Legal downloading without having to explain to your ISP.
- Safely share files with friends and relations or work colleagues.
- Better security on public wi-fi access points.
- AES high level security when banking online.



Krita Workspace

Picture Perfect

David Briddock explores Krita, a graphics app with a chequered history but a bright future

When most people think of desktop graphics programs, the same old names keep popping up. Adobe has always been high on the list with its Photoshop and Illustrator products, but these products aren't cheap. In fact, they seem increasingly expensive when compared to the range of high-quality apps for iOS and Android.

Yet this is a golden opportunity for open-source apps to shine. One of the best known is the GNU Image Manipulation Program (GIMP), which is pretty much an I-can-do-that-too replacement for Adobe Photoshop. However, it takes time to learn and isn't really suited to sketching out quick ideas or developing arty compositions.

Let's look at one of the new kids on the block, an open-source app competitor called Krita (**krita.org**).

What Is Krita?

At its heart the Krita app we see today is primarily a painting program, although this wasn't always the case and, just like GIMP and Photoshop, it has a sizeable collection of image processing capabilities.

The Krita development team's goal is to build an app for creative people who are looking for a computing platform that offers the same kind of control, precision and flexibility as found in real-world professional art materials, tools and workflows.

The latest version has achieved many of these goals. Being open-source means Krita is free to download by anyone who's after an end-to-end digital solution for creating sketches and digital painting from scratch.

And as Krita works with the artist in a snappy yet unobtrusive manner, it's started to entice seasoned GIMP and Photoshop professionals for concept art, comic books, texture rendering and other similar tasks.

From Hack To App

Krita has a deep Linux backstory. It all started with a Linux hack by Matthias Ettrich to demonstrate the K Desktop Environment (KDE) graphical user interface (see boxout).

Ettrich's hack came about because he was to give a presentation at the 1998 Linux Kongress. The talk's topic centred around how to convert apps coded from the rival Linux Qt user interface toolkit to KDE. The app he chose to convert was GIMP.

As it happened, the KDE community liked the idea of an image manipulation app, and the code soon became part of something

called KImage. KImage was actually part of another famous KDE project called KOffice. This was partly down to the KOffice's rich library collection, which offered filter handling, text manipulation and so on.

Over time, KOffice went on to become Calligra. At around this time the KImage name was changed to KImageShop. However, the KImageShop name fell foul of trademark law in Germany, and KImageShop was renamed to Krayon. Yet Krayon also had trademark issues, and the app was finally renamed to Krita in 2002.

A Struggle

Initial development progressed slowly. That's not unusual for embryonic open-source projects, which need to attract a core team of appropriately experienced software developers.

However, the project gained much greater community support in 2003, and the first public release appeared in 2004. Just a year later Krita gained features like OpenGL, plus CMYK, Lab, YCbCr, XYZ colour models and high bit depth channels.

At the time, Krita's code contributors were happy enough. To them, Krita development was a fun and interesting hobby. However, the user base wasn't really growing. The main problems centred around product direction and code quality.

While new features continued to be added, it didn't always mean they worked as expected. This wasn't helped by a decision to back-port Krita to support Qt GUI environments. Trying to support the Qt toolkit as well as KDE only resulted in unworkable software releases, even for basic things like copy, cut and paste.

So even that small user base was starting to become disenchanted with the project.

Lightbulb Moment

The moment of clarity for Krita came out of the blue – and from a rather unusual source.

This source was David Revoy's Chaos and Evolutions training DVD (**goo.gl/dnUxio**), targeted at 3D artists. In this DVD, Revoy used a combination of tools to create his professional art: Alchemy, My Paint and GIMP.

After watching the DVD it was evident that not only hadn't he used Krita, but that Krita wasn't able to support the kind of day-to-day tasks and workflows that confront professional artists. Boudewijn Rempt, a core Krita maintainer since 2004, stated what they had was, "a very nice application, but not yet suited for daily work for a professional."

So the team stopped coding and began to compile a list of what artists really wanted to see in Krita and how they should go about implementing these features. This proved to be a real turning point.

Rapid Enhancement

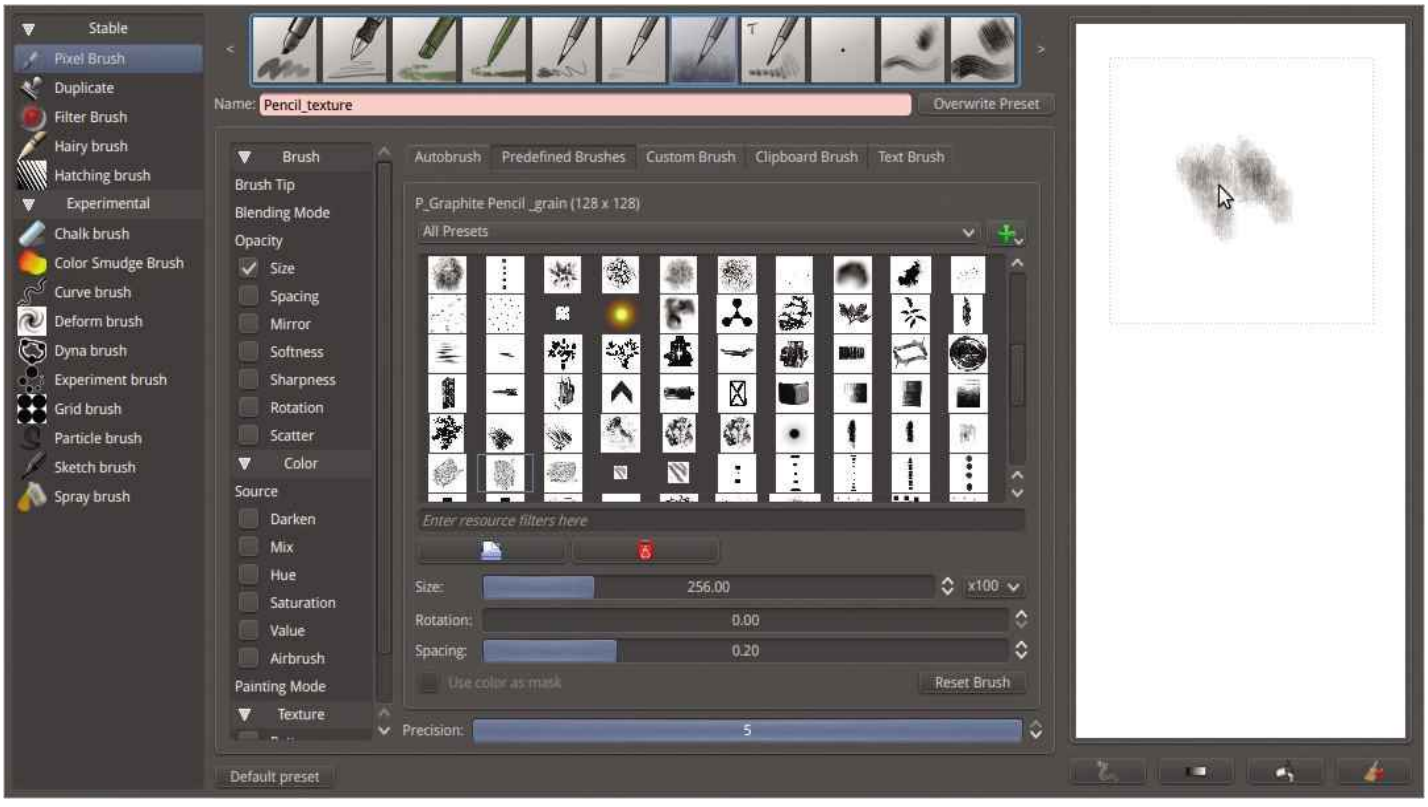
From around 2009, Krita stopped trying to be a generic image manipulation/painting application in the style of Photoshop or GIMP. Now the focus was squarely on painting elements, with the goal of making Krita a premier painting application for cartoonists, illustrators and concept artists.

It also decided that in future each development sprint review would be attended by as many artists as coders – artists who'd

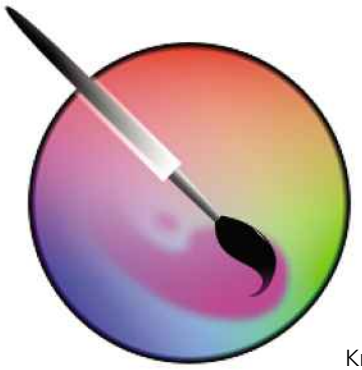
What's In A Name?

Krita is the Swedish word for crayon and 'rita' itself means 'to draw'.

Krita's mascot is Kiki the Cyber Squirrel, an anthropomorphic squirrel character designed by Tyson Tan. An initial version of Kiki was submitted to the KDE forum in 2012 and first appeared in the Krita 2.6 introduction booklet. And Krita 2.8's splash screen used a revised version of Kiki.



Krita brush engine



provide valuable feedback about how they'd use a particular feature in practice.

Strengthening the team was another goal. So around this time the Krita funding pot was used to employ Lukáš Tvrdý as a full-time developer. Tvrdý had worked on brush engines for his thesis and would be instrumental in fixing stability issues, long-standing bugs and boosting Krita's graphical performance.

The Krita project also used its funds to hire specific individuals within the community to work on the code base. And it was able to extend the team still further through funding generated by Google's Summer of Code initiative.

The result was a substantial jump in stability and performance over a short period of time – something that was immediately apparent to the now growing Krita community, who eagerly downloaded each new build release.

With the direction now clear but adequate funding still a potential bottleneck, in 2013 the Krita community created the Krita foundation (**krita.org/item/announcing-the-krita-foundation**) to encourage greater development support.

Version 2.9

Krita 2.7 and 2.8 contained significant amounts of new and updated functionality, but the latest release, version 2.9, is the most impressive one yet. The raft of new features are the result of over eight solid months of development effort.

Some of the highlights include HDR painting support, richer image document handling, advanced illustration transformations, streamlined workflows, filter and layer improvements plus support for 3D images and textures. The extra funding needed to drive all this development came in part from a Kickstarter launch.

Krita uses OpenGL to remove painting lag and improve canvas zooming, rotation or panning performance. Nvidia graphics chips and the latest Intel GPUs work best, but ensure your OpenGL drivers support a minimum of OpenGL 3.2.

Interestingly, there's partial support for Photoshop brushes. Full support isn't actually possible because Adobe hasn't disclosed its ABR file format specification, and it's only been achieved after some clever reverse-engineering of the example ABR files.

To get the best from Krita you really need a pressure sensitive tablet. There's support for Wacom, Huion and other uc-logic based tablets, on both Windows and Linux, while Genius tablets are still problematic.

Widespread Support

Listening carefully to its users has paid off. There have been over one million downloads of Krita for Windows. Meanwhile the Krita on Steam edition is doing pretty well too.

Linux Desktops

Linux has always had a number of competing desktops, which provide the user's graphical User Interface (GUI) experience. KDE is one of the best known. But there's also Gnome, XFCE, Wayland and others.

Linux users tend to defend their choice of GUI fiercely, and effectively form a sub-community within the Linux family. Yet, as Linux has spread from desktop to tablets, smartphones and onto even smaller devices (like the Raspberry Pi), lightweight-style and mobile-friendly GUIs have risen dramatically in the download charts.

As for the professional marketplace, around 40 studios already work with Krita Studio, which is the paid-for supported version. And while showcasing its capabilities at the 2014 SIGGRAPH Conference (s2014.siggraph.org) the feedback included many stories of happy and contented Krita-wielding artists.

Part of the reason is that studios are increasingly dissatisfied with Adobe's Creative Cloud and are looking to port all their artists onto Linux workstations. Many other key applications, such as Maya, Modo, Nuke and Mari, already run on Linux.

So adding Krita into the mix as a highly capable 2D painting app, which already contains most of the filters a professional artist will need, means a move to Linux makes even more sense.

In addition, Krita's GNU GPL-style licence guarantees future freedom for all platforms and ensures code modifications are always shared with the wider community. But importantly, any Krita-generated artistic output can be treated as commercial material.

> **Listening carefully to its users has paid off. There have been over one million downloads of Krita for Windows**

Nevertheless, professional users are always after more features, better performance and ideally workflow scripting support. The recently formed Krita Foundation aims to achieve this by attracting new funding, consolidating the versions of Krita and streamlining developer resources.

Krita is a test case of how, even with a good idea, it's not easy to take a project from inception to worldwide success in the open-source environment. But it shows it's still possible with the right insights, approach and lots of hard graft.

Joining The Community

As always with an open-source project, the community is king. To get started, download and run the Krita app to discover its virtues. Then send feedback on the areas you'd like to see improved.

If you find a bug, it can be reported at the KDE bug tracker website (**bugs.kde.org**). You should get a reply within a week. And if signing up to KDE's bugzilla is too much bother, just post it on the forum or IRC (**krita.org/irc**).

And you don't have to be a skilled software coder to help out with the Krita project (or any of the multitude of other open-source projects for that matter). You could create written or video tutorials, add some sample files, create product artwork, update the user documentation or simply spread the good word about what Krita can do.

Just check out the Join Krita web page at **krita.org/get-involved/overview**. mm

➤ *Krita mascot Kiki*

Top 5 Annoying Facebook Things

It's the world's most popular social network, but it's possibly the most irritating too

1 Fake Competitions

You know that lovely warm feeling you get when someone Likes something you posted on Facebook. Well, apparently, companies enjoy that so much that they're willing to give away iPads and sports cars in exchange for a few more clicks on that Like button. Click on their page, though, and you'll see their account was set up the week before. You'd think people would understand that this means it's fake, but it seems not, because these make-believe competitions always have thousands of Likes from what we assume are not very bright people.

2 Being Given Orders

We're all for nostalgia, and we understand the importance of supporting charities, but we're not doing something just because everyone else is doing it. So no, we won't share a photo of a He-Man lunchbox just because we remember having one. And no, we won't film ourselves getting drenched in ice cold water just because everyone is telling us we should.

3 Game invitations

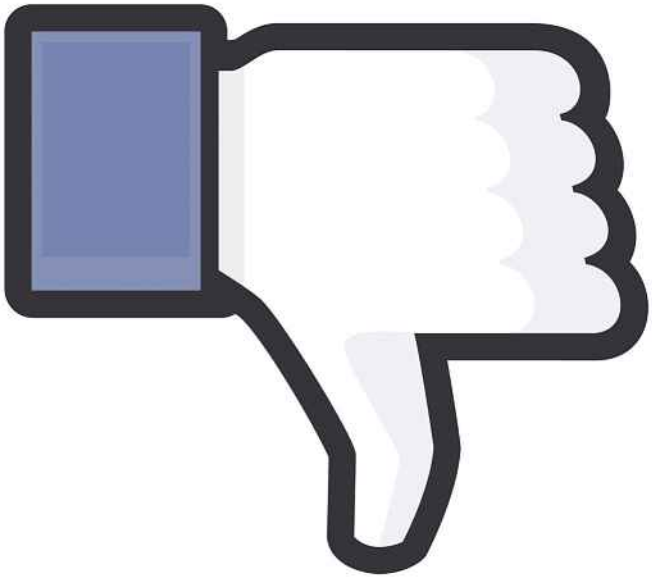
It's amazing how addicted people get to mobile games. It's like a drug where they just can't seem to get enough. But unlike drugs, it seems it's considered socially acceptable to push the object of your obsession on others. If you're one of those people, then you should realise that every time you send of these game invitations, you're basically saying, "Hi there. I want you to destroy your productivity like I've destroyed my own." All so you can get a few more virtual coins or whatever. Shame on you.

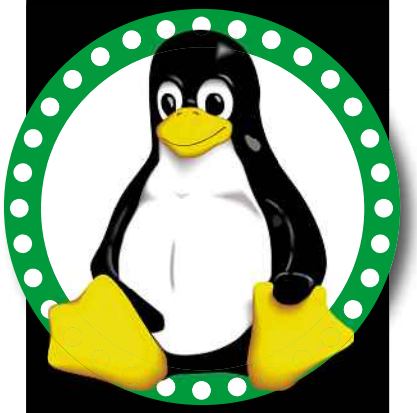
4 Constant Pouting Selfies

There's a reason pride (and by extension, vanity) is considered one of the seven sins. But somehow a vast portion of the population don't seem aware of this, so they're happy to post regular self-taken photos of themselves, turning their head slightly to one side and pouting. The odd vanity shot is okay, we suppose, but every single week? People, please get over yourselves.

5 Boasting

As well as constantly wanting to show the world how beautiful they are, people also like to use Facebook to tell everyone just how amazing their life is. Yes, it's nice for you that you just got your dream job (probably arranged by your parents), that you just moved into your dream house (also thanks to your parents) and that every day for you is full of sunshine and roses, but do you really have to keep telling us about it?





Summer Projects

Get the kids in to Linux

David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

It's nearly that time of year again when the kids break off from school and spend six weeks getting up to mischief, catching up on their gaming, heading off to the beach and generally doing all the cool stuff they can't get up to while at school.

For something a little different this summer, and if the British weather decides to throw a curve ball and drop the annual rainfall over a single weekend, how about giving the kids a little project to complete? Find a version of Linux they like.

Linux For Kids

There are plenty of Linux distros designed purely for children, especially younger ones. The older kids could be interested in developing a more mature, or in our case, an ordinary desktop. Ubuntu, despite how everyone seems to hate it so much, is a good start.

There's also Linux Mint to consider, especially with Mint 17.2 Rafaela just having been released. If the older child gets into using Linux, the command line and how everything works differently to Windows (which is what I imagine they're more used to, through school and so on), then they could move on to more complex distros, such as Arch.

Eventually, after some time with the new OS and after they've cut their teeth on something like Arch, they could have a bash (excuse the pun) at creating their own distro, with Linux from Scratch or through some other means.

The younger children may not appreciate the complexities of the OS, which is perfectly fine. For them there are couple of popular options:

DoudouLinux

DoudouLinux is an interesting Debian-based distro for children aged between two to 12 years. It's bright, fun, easy to use, and has been designed to be as pleasing as possible through the heavily customised LXDE desktop and simplified navigation system

It's a pretty good distro, with parental controls, web filtering, ad blocking and comes with support for something like 44 different languages.

Edubuntu

Edubuntu is one of the more famous Linux projects aimed at children. It's hit a few rocky patches in its past, but version 14.04.2 LTS is alive and well and available from the main Edubuntu.org website.

Edubuntu is designed for children and young people aged from five up to 15, and probably beyond. It has just about every educational program and tool you can imagine pre-installed, with the ability to further extend that list from the countless number of educational titles already available for Ubuntu.

Do they need a child-specific distro, though?

That's a question we've mused upon for a while. It's all fine and well having a child orientated Linux distro, but let's face it most children these days are more than capable of navigating an operating system without it being customised too heavily.

A lot of us are more than familiar with the, 'how do I do that, son/daughter?' routine, while they swipe, click and sigh at their out-of-date parent's attempts at getting something to work. Just as we did with our parents, no doubt. Still, it's a noble cause and one we're quite happy to mention.

So how about it then, get the kids into Linux from an early age and give them the freedom to become the Linux/open source designers and developers of the future.

Get the next generation of Linux users ready for the future

Insert Disk 2
(Audio CD by Instant Remedy)

Sven Harvey has a listen of the new album

Well this is potentially a first – an audio CD release of a selection of Amiga gaming and scene tracks from different composers, all re-arranged/re-mixed by the same musician (well with one guest track in this case).

The musician behind the album (and all but one track) is Martin 'Instant Remedy' Noriander, and as you can tell from the track listing he was clearly inspired by the (electronic) dance-themed (with a bit of spacey techno/trance thrown in) music from many Amiga releases. His goal was to avoid changing the feel of the music as such, but just bring the tracks into the 21st century, with some extra personal flair, and work started on the album in 2007.

My go-to tracks on this album happen to be Lotus 2 (track 2) and Pinball Dreams (Track 12) – and this is clearly down to the fact that they are incredibly reminiscent of the original music that came out of Paula on the Amiga 500 I originally played those games on. The instrumentation sounds just like that from the original with the 21st century extra touches merely enriching the experience further.

Both Megamixes are also a wonderful intro to the music of the two composers in question, again maintaining the feel of the individual tracks that so the melodic medley brings a nostalgic rush.

With the exception of two tracks the feel of the entire album is that of the original music, including Peter W's guest track, but those remaining two tracks that are also worth picking out for another reason. These are pieces of music originally by Allister Brimble and have, in the past, been remixed in line with the goals of this album by others, and also updated by Allister himself (Team 17 Works, Sounds Digital and The Amiga Works!). Martin went in a different direction with Project X and Full Contact on his album. Full Contact features a much more open feel to it, while Project X goes a even more spacey mixing the feel of the open vacuum of space and the crowd of a music festival in combination with a subtle reworking of the music to give it something new.

I personal don't feel there is a bad track on the disc, though one or two, perhaps, are not up to the standard of the others.

The album is also available as a download and via streaming services (but, frankly, the quality of the free Spotify streaming of the tracks isn't near as good as the CD, but it'll do for demo purposes!). Whichever way you choose to listen, you will enjoy the album.

DETAILS
- Price: around £13
- Publisher: 010101 Music
- Website: www.0101 01-music.nl

micro mart
Quality 9
Value 8
Overall 9

Disc Track Listing

1. Battle Squadron Ingame – Ron Klaren
2. Lotus Turbo Challenge 2 Theme – Barry Leitch
3. Paranoimia CrackTro Ready – Enzo Cage
4. Seven Gates Of Jambala – Jochen Hippel
5. Jochen Hippel Megamix – Jochen Hippel (features Lethal Excess Options, Warp Ingame, Wings Of Death Levels 1, 5 & 6,Chambers Of Shaolin Test Of Balance, RSI Theme and Chambers Of Shaolin Test Of Strength).
6. Lost Patrol – Chris Glaister
7. Project X – Allister Brimble
8. Chris Huelsbeck Megamix - Chris Huelsbeck (features Turrican 2 The Final Fight, The Adventures Of Quik & Silva Ingame, Turrican Shoot Or Die, Turrican 2 The Wall, Turrican 2 Desert Rocks, Turrican 2 Final Challenge and Apprentice).
9. Battle Squadron Game Over – Ron Klaren
10. Full Contact – Allister Brimble
11. Turrican The Tower – Chris Hulsbeck (arranged & performed by Peter Wennergren)
12. Pinball Dreams Nightmare – Olof Gustafsson

Sven Harvey has been our Amiga specialist for over 15 years drawing on his 24 years retailing computer and video games (25 Christmases, no less) and even longer writing about them.

Amiga

Take A Bite

Apple Music is here, and Ian McGurren dives in for a listen

Ian McGurren is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

Industry observers have found it somewhat odd that the leaders and flag bearers for the downloadable music industry have taken so long to enter what many see as its eventual successor, subscription-based music streaming. When Spotify was launched, it seemed only a matter of time until Apple would add a subscription model to iTunes and kill off the competition. It didn't, and Spotify, Deezer, Rdio, Pandora and many similar models flourished. Now, in 2015, Apple is finally bring its offering to the streaming party.

Chances are that you may already be aware of Apple Music, but for the wrong reasons, with a certain well-known pop singer taking exception to Cupertino giving away her wares for nothing to promote its new product. Now that the dust has settled, and Apple has rightly understood that other people's hard work is not its own to offer free of charge, can the service emerge out from under the shadow this controversy has created?

Slightly confusingly Apple Music comes not as an app or even an update to the Music app, but as part of a whole iOS update (yes, you need to be on iOS 8 for it). This is partly due to the service's heavy integration with iOS itself, including Siri control (more later). Once updated, it's not that clear what to do. The first page to offer the service actually appears twice, both times with different text, and while the service has a three-month free trial, it still asks you to 'pay' for something. While it's fair to understand that's for after the trial, no mention is made of that on the pop up.

Once up and running, the service is mostly as you'd expect – iTunes without the need to pay for each track, plus a few bells and kiwi-led whistles. Search a song and chose either your own or the Apple Music library, and if it's there, you can play it. That's the basic idea and that's really all Apple Music ever needed to be, and therefore it's confusing people as to why it's not happened before now.

But if you're launching a competitive streaming service in 2015, however, there's some pressure to offer that little bit more than the basic streaming. Apple's answer to this comes off the back of its acquisition of 'trendy' headphone maker Beats, with its nascent streaming service and a smattering of big name DJs. DJs? Yep, the Apple USP is a real (well, streaming) worldwide radio station, Beats 1, helmed by excitable ex-Radio 1 DJ Zane Lowe, with shows curated by the likes of Queens of the Stone Age's Josh Homme. As USPs go, it's... different and something of a retro step that may not hit home with those more used to not even listening to a whole album of their choice. There are other 'stations', though really these are the same playlist affairs as all other streaming services.

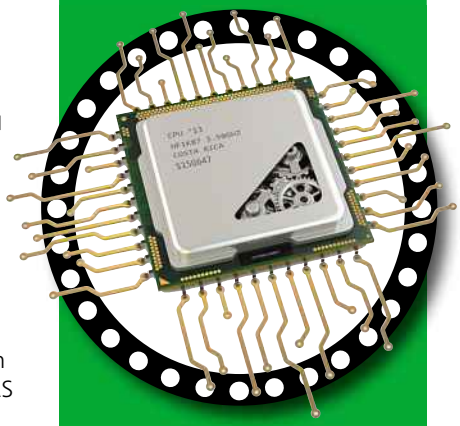
What should be the real USP for most users is the possibility of deep integration with iOS itself. Having the whole of iTunes at your command via Siri, especially hands-free, should be amazing, but it just doesn't work consistently. Music on your device can be started by voice, and while Siri will play Apple Music radio from Siri, it often won't play specific artists or tracks, even though it claims to be doing so. Sometimes what does work will only work when unlocked, meaning hands-free is out of the window. Given Apple's work on making iOS car-friendly, this seems an odd omission.

So will Apple Music be a success? It has one factor the rest will find hard to compete with: convenience. Many users, even those with Spotify, will still have some use of the Music app, even just for their own music. To move all music, even streaming, to one app is attractive. When it works – when it's performing the basic functions, that is – it work well and as it should. The radio is a bonus, but it's unlikely to draw that many in, and at £9.99 a month, it may find it hard to compete with Spotify in the student market (who get Spotify for £4.99 per month). For many, they may find the free trial a bonus and then be too lazy to cancel, whereas others may stick with their current provider. All you can really conclude is this: Apple Music is here, but it offers little the others don't.

Mobile

Das Fritz!Box Kind

The Fritz!Box 4020 is the latest product in the best router range you've never heard of, says Andrew Unsworth



I'm a bit of a fan of AVM's Fritz!Box range of routers, mostly because they're packed full of high-end features that shame other routers yet they're laughably user-friendly, and when I say user-friendly I don't mean over-simplified and cutesy. FritzOS, the operating system used to control Fritz!boxes, is a joy to use thanks to its logical layout, helpful labels and informative charts, such as the graph that displays wireless activity on a set of wi-fi channels so users can choose the least congested wi-fi channel in order to maximise performance.

Of course, Fritz!Boxes aren't perfect. They're relatively expensive for a start and you typically have to buy them from online retailers such as Amazon (**www.amazon.co.uk**). I was therefore pleased to receive a press release stating that the AVM has released a baby Fritz!Box that should be easy on the wallet. Does it still have all of the top features that make Fritz!Boxes so popular with tech journalists? Well, sort of.

One of the best features of previous Fritz!Boxes has been dual-band support, often simultaneous, and that was at a time when few people had devices that would work on the less-congested 5GHz band, never mind a router. Sadly, the 4020 only works on the 2.4GHz band. If all you want is a general-purpose router that'll work with the widest range of devices, then this should suffice, especially as this 802.11n router is rated at 450Mbps. There's no DSL modem installed in the 4020, but that's not so much of a problem given that the 4020 is intended to be used as an extra router around the home or office. It does, however, support the use of 3G and 4G modem dongles should you wish to connect to the internet using mobile broadband, and this feature is also a good option should your regular broadband connection fail and you need to get online. This is a pretty common feature with Fritz!Boxes and it adds to their versatility, so it's good to see it applied to an entry-level model too.

> **"One of the best features of previous Fritz!Boxes has been dual-band support"**

Another neat feature often seen on Fritz!Boxes is the NAS feature, which lets users connect a USB hard disk or flash drive and use it as cost-effective network-attached storage. This is especially handy if you have files or forms that you often use for work, or music that you want to listen to on a variety of devices. You can simply put them on a USB flash drive, attach the drive to the Fritz!Box and then access them at will.

There are other features, and you should check out **en.avm.de** to learn more about them. I like the sound of the 4020, but I will, of course, wait until I've used one before I pass judgement. With the low price of €59 (according to the press release), the Fritz!Box 4020 could be the router to make Fritz!Box a more recognised brand in the UK.

Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

Neverending Story

Patton Oswalt will lead the voice cast in Telltale's Minecraft: Story Mode, "a tale of adventure and survival" based on Mojang's hit sandbox game

This week, Ryan checks out the first details from Telltale's Minecraft: Story Mode, and checks in on the progress of Visceral's mystery Star Wars game...

Plug & Play

It's now a year since Markus 'Notch' Persson sold Mojang – and with it the rights to the phenomenally successful *Minecraft* – to Microsoft for a startling $2.5bn. It marked the moment when the game's status changed from plucky indie cult hit to a true, established media phenomenon; the sum total of *Minecraft*'s downloads is thought to be somewhere north of 100m.

The *Minecraft* franchise is also set to grow, with Mojang partnering with Telltale Games to create *Minecraft: Story Mode*. Formally unveiled at this year's MineCon in London, it's a five-part adventure game which takes in some of the familiar locations from Mojang's hit – the Farlands, the Never, the End, and so forth. Telltale has made its reputation by making point-and-click adventure games like *The Walking Dead* and T*ales From The Borderlands*, so it's likely that *Story Mode* will apply a similar formula to the *Minecraft* world; the studio's press release, for example, talks about "a tale of adventure and survival" with "choice based gameplay".

"You will drive how the story flows through the decisions you make: what you say to people (and how you say it), and what you choose to do in moments of thrilling action," the trailer's YouTube description explains.

The studios haven't spared any expense on pulling together the voice cast, either. The new central character, a determined-looking chap named Jesse, will be voiced by actor Patton Oswalt, while other characters in the game will feature the tones of Paul Reubens, Billy West, former 80s heartthrob Corey Felman and *Goonies* graduate Martha Plimpton.

The most charming thing to emerge from the project so far is a little mini-game called *Info Quest II*. Published on the game's website (**www.minecraftstorymode.com**), it's basically a little interactive press release delivered in the style of a point-and-click adventure. In it, Persson himself (well, it at least looks like a boxy, *Minecraft* version of Notch) comes out of retirement to talk about *Minecraft: Story Mode* – and explain why in the world a game based on survival and crafting needs a narrative adventure in the first place.

"We've begun to realise that there's a massive demand for fiction set in the *Minecraft* universe," the jovial Notch avatar says. "People love engaging with the world, whether they're building, adventuring, or role-playing an awesome creeper slayer. The tricky bit is working out how to explore the story without diluting *Minecraft* itself. A Telltale game set within the world is one way to delve deeper without laying down official lore. It's one interpretation of the world and its logic."

If *Story Mode*'s a success, it's likely we'll see many more seasons come out in years to come. But what about that tantalising mention of Minecraft 2 in that little *Info Quest II* game? "The Minecraft 2 thing was a joke," a post on Mojang's website says. "No really. It was a joke."

Minecraft: Story Mode is due for release later this year.

Online

Star Wars 1313 is one of those great-sounding games we'll never get to play. An action adventure that would have told the story of how Boba Fett became a bounty hunter, it was revealed at E3 in 2012, only to be put on indefinite hold one year later when Lucasfilm was bought up by Disney. With LucasArts now essentially closed and EA handling the creation of all *Star Wars* games for the next decade,

➤ *While Visceral works on its mystery Star Wars action game, BioWare's preparing a new expansion for The Old Republic*

the chances of *Star Wars 1313* ever seeing an official release are vanishingly slim.

The Force ghost of that lost game could, however, be set to return in a different form. EA-owned studio Visceral has been furtively working on a new *Star Wars* game since last year - a project shrouded in secrecy while EA DICE bangs the marketing drum for *Star Wars: Battlefront*, out this autumn. What we do know about Visceral's game is that former *Naughty Dog* designer and writer Amy Hennig is working on it. Hennig's previous work has included *Legacy Of Kain* and *Uncharted* – all action adventures, which might lead you to suspect that her *Star Wars* game for Visceral will follow suit.

That thinking's backed up by *Uncharted* voice actor Nolan North, who seems to have some inside knowledge of Visceral's game.

"If you're a big fan of Amy Hennig and her style of story, she's going to reboot a brand new *Star Wars* franchise in the style of *Uncharted*," North said in a Q&A at the MetroCon anime convention. When asked whether it would be like *Star Wars 1313*, he replied that it would "be along the same lines."

There were suggestions last year that Visceral are working on an open-world *Star Wars* title in the mould of Bioware's *The Old Republic*, while more recent rumours have named Han Solo as the game's narrative focus. Barring some revelatory news leak, Visceral are likely to keep a tight lid on things until at least next year.

On the subject of *The Old Republic*, Bioware are still plugging away at its mega-budget MMO, even if it hasn't quite garnered the mass following EA were surely expecting. A new expansion called *Knights Of The Fallen Empire* will introduce a new story with an all-new threat: an ominous-sounding faction called the Eternal Empire. Taking place over nine chapters, the expansion is billed as a return to the more single-player-focused storytelling Bioware's known for. You the Outlander, a veteran of the Great Galactic War who crosses paths with a stern-looking emperor called Valkorion and a masked, "dark prince" called Arcann. It sounds like classic *Star Wars* stuff, even if it doesn't link up with *The Force Awakens* as some might have expected.

Knights Of The Fallen Empire launches on the 19th October.

Incoming

Remember *King's Quest*? Quirky developer The Odd Gentlemen certainly do, even if the original game came out way back in 1983. In conjunction with Sierra, they've revived *King's Quest* as a series of Telltale-style episodic adventure games, focusing on the younger years of the protagonist King Graham of Daventry. Brought to life with some really quite charming hand-painted and very colourful graphics, the new *King's Quest* will offer lots of point-and-click exploration and puzzles to solve.

The game's broken down into five chapters, with the first, called *A Knight To Remember*, relating Graham's bumbling attempts to fight a dragon. That first chapter's out on the 28th of July, with the release of the next instalments to be announced at a later date. If you want to get an idea of The Odd Gentlemen's unusual approach to design, do check out *The Misadventures Of PB Winterbottom* – it's a delightful little platform puzzler.

➤ *The Odd Gentlemen are putting the finishing touches to a new episodic King's Quest game, with the first chapter out on July 28th*

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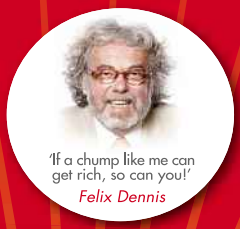

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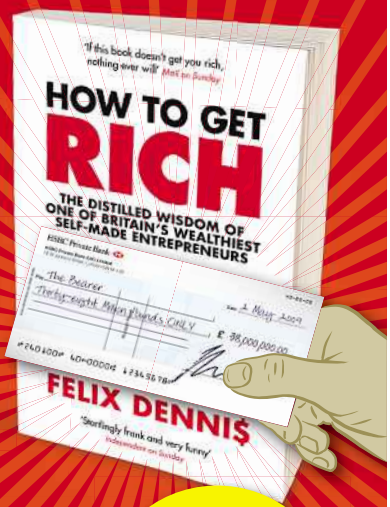

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DELL OPTIPLEX GX240 SFF. P4/1.6, 20GB hard Drive, 768MB RAM, CD-Rom, 10/100 network, Sound, Front USB, Clean install XP-pro, fully updated, works OK but slow by modern standards, £15.
Tel: Pat (07710) 348638
Email: pat4cars@aol.com

56kb Fax Modem External. £10.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

LG Flatron W2246S 22" monitor with power and VGA leads. No dead pixels in very good condition. £50 Buyer Collects (Verwood, Dorset)
Tel: (01202) 826057 Email: geoffandcynth@themailspot.com

2x 1GB PC2100-648. These two matched sticks were removed from one of my redundant systems. Plus one PC2700 (DDR 333Mhz) and one 512Mb PC3200 DDR400 stick. All for £5 plus £2 P&P.
Tel: Alan (02084) 202322
Email: alan@asandco.co.uk

Very rare Viking IBM 16MB Dram Card (15109 66G5109) for Compaq, IBM Thinkpad, Etc Laptop Only £20
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

TP-Link 54Mbps 4-port Wireless G Router. Perfect, boxed. Model: TL-WR340G. £20 plus postage.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Intel Core 2 Duo E4600 3GHz 775 Socket Processor. Tested and removed from a working environment. £10 inc Free Courier. Payment via PayPal.
Email: info@jmcomputing.info

Addon Wireless LAN USB 2.0 54Mbps 802.11g Adaptor. Boxed w/ manual and software: £9.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

CD Stomper CD/DVD Labelling System: Software, Labels and Label Applicator. Boxed. Unused. £9.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

DIR-615 Wireless N Router. Boxed, brand new. £30.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Laptop DDR2 memory sale. 2 Corsair Value Select 533mhz 1GB £18 pair, 2 Hynix 800mhz 2GB £26 pair, 2 Generic 533mhz 1GB £15 pair,1 Generic 800mhz 1GB £10,1 Nanua 666mhz 1GB £, 1 Samsung 666mhz 1GB £8. Postage included
Tel: Jeremy Gill (02089) 430683
Email: arthur.pewty1@virgin.net

2x 120GB Maxtor DiamondPlus 9 Drives plus 1x 80GB DiamondPlus 10. Can be supplied with 2x plug-in caddies. Reasonable offers please.
Tel: Alan (02084) 202322
Email: alan@asandco.co.uk

HP Elitebook 8760w i7 2820QM @ 2.2GHz 32GB RAM 750GB HDD Quadro 4000M GPU. Only 2 small marks on whole machine. Cost £3500 when new. £900 ONO
Tel: (07772) 926632
Email: stedaley19@gmail.com

WD 2TB desktop HDD. Formatted ready for an OS. Runs very nicely. New laptop means desktop items must go! £40 inc. tracked postage.
Tel: (01619) 501218
Email: jmbest2@sky.com

Toshiba C500D-B-11 laptop. Almost new cost £279 will accept *£150ono*
Tel: (01217) 535324

Intel 3930K processor. Used, but not overclocked. No box or fan. £220 ono. Will ship to UK address.
Tel: Tim (01623) 624509
Email tim.stirland@btinternet.com.

Amstrad PcW 9256 in good working order with software. Offers.
Tel: John Adams (02088) 641202
Email: meeching@uwclub.net

Asus P8Z68-v LX socket 1155 motherboard. Original box 1/0 cover user guide driver disk fitted core i3 2100 CPU 3-1GHz and 8GB PC1300 memory. No fan. Working fast and fine. £125 + free postage.
Tel: (01619) 501218
Email: jmbest2@sky.com

ASUS P5B Motherboard - 775 Socket - DDR2. Tested and removed from a working environment, comes with I/O Plate. £35 inc Free Courier. Payment via PayPal.
Email: info@jmcomputing.info

SAMSUNG GALAXY Tab 3 for sale. 2mths old, 8GB, wi-fi, £80 open to offers. Willing to post at a charge.
Tel: Christine (01386) 831836

SoundBlaster Audigy SE 7.1 soundcard for sale. Perfect working order but not needed any more. Just £12 plus postage.
Tel: Ian (01132) 629028
Email: ianmatthewuk@yahoo.co.uk
Asus p8h61-mle motherboard socket 1155. Original box 1/0 cover driver disk manual together with Celeron 91620 dual core CPU and 4 9195 pc1300 memory. Working fine. No fan. £70 + free postage.
Tel: (01619) 501218
Email: jmbest2@sky.com

Toshiba Satellite SA60 laptop. Model PSA60E-092058EN. Windows XP Home Edition with Certificate of Authenticity. For spares or repair - broken power connector on mobo. No power cord. Otherwise in very good condition. £40.00 + p&p
Tel: Peter Scarth (01452) 372350
Email: pscarth@blueyonder.co.uk

400GB IDE drive 3.5 inch formatted ready for use. Only £20 plus £3 for p&p. I can load genuine XP Professional from Microsoft with genuine certificate of authenticity for an extra £10. Refurbished.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Panasonic KX-P7105 mono laser duplex printer. Some toner left. Up to XP only – hence £25. Buyer will need to collect from N2, East Finchley
Tel: (02083) 431527
Email: pnnikiel@gmail.com

HARDWARE WANTED

Trying to breathe life back into an old machine? Why not submit a wanted ad and see if any of the thousands of computer enthusiasts who read the magazine each week have what you're looking for?

WANTED: PC Tower case (beige colour if possible) to rehome an Amiga A1200 vintage computer. The Amiga motherboard is H 410mm x L 190mm (H 16" x L 7.5"). PSU not an issue but if available 250 watt more than enough.
Tel: Bill (07742) 061569 or (02641) 769503.

WANTED: Fractal Design Define XL full tower case. R1 (original version) in black.
Tel: (01670) 860146
Email: mm@tectron.co.uk

WANTED: Working Dot Matrix Printer in Good Condition. Thanks!
Email: printer.20.odaily@spamgourmet.com

WANTED: Acorn computer either an A5000 or A7000. Also book on teaching yourself binary.
Tel: (07817) 861011
Email: Johnhaviland73@gmail.com

SOFTWARE FOR SALE

Do you have old software that you simply don't use? Why not advertise with us and see if anyone else can make use of it – you may well be surprised to find that someone is looking for it!

Adobe Photoshop Elements and Premiere Elements 12 Full Version - Windows/Mac. Original Boxed CD with unused product key. £47.50
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

PCB design software 127 layers, schematic entry, PCB entry, PCB to Gerber file converter, output to printer. £9.99
Tel: Nigel Wright (07967) 527693
Email: cresswellavenue@talktalk.net

Cyberlink PowerDVD 12 Standard. Runs under Windows 8, 7, Vista or XP. Original CD with unused product key £7.50
Tel: Ian (01932) 856971
Email: a2345@btinternet.com
Microsoft Office 2013. Original Software only £100.
Tel: Gordon (01314) 660205
E-mail: scobieg09@gmail.com

Windows 7 Ultimate 32-bit version. NEW software and license (certificate of authenticity) 100% genuine and unopened software .ONLY £45 including P&P.
Tel: Dave Thomas (07828) 982930 or (01942) 706571
Email: davethomas96@aol.com

Sim City 2000. Boxed and original. Classic gaming. £15.
Tel: Gordon (01314) 660205 E-mail: scobieg09@gmail.com

Windows 2000 Professional. NEW software and license (certificate of authenticity) 100% genuine and unopened software. ONLY £15 including P & P.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Windows Vista Business. New and sealed. software and license (certificate of authenticity). 100% genuine and unopened. (Dell branded but will install on any machine) ONLY £15 including P&P
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Windows 7 Home Premium 32 bit versions. NEW software and license (certificate of authenticity) 100% genuine and unopened software .ONLY £35 including P & P.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Windows 7 ULTIMATE 32 Bit and 64-bit DVD disks incl. SP1 This is my "Get Genuine Kit" from Microsoft not OEM. New install or legalise your copy with full Product Key. only £50 incl. reg. post
Email: Dave ochdgh@aol.com

Nuance Omnipage 18. OCR for Windows 8, 7, Vista or XP, Original CD with unused product key £25.
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

Acronis True Image Home 2012. Bootable CD. Application runs under Windows 8, 7, Vista or XP. Original Acronis CD with unused product key £5.
Tel: Ian (01932) 856971
Email: a2345@btinternet.com

SOFTWARE WANTED

Wanted: I have a BCL 2.4g Wirless Gaming Mouse, Model: RF0P77 (3v 7ma) but no Drivers. Can someone help with a copy of the Original Drivers for this Wireless Mouse>??
Email: Cliff Evans
cliffordevans603@btinternet.com

Wanted: Driver disc for Toshiba L30-11D PSL33E laptop. Laptop useless without drivers but only worth £40, so cannot pay a lot.
Tel: John Udall (01384) 824494
Email: john.udall@blueyonder.co.uk

Wanted: Windows XP SP2 or Windows 7. Also a boot disc for Toshiba satellite L40-18Z.
Tel: Mr Cranney (07948) 927384
Email: mcrnny1932@gmail. com

Wanted: Windows 98 CD ROM with boot disk instruction manual and serial number. included.
Tel: Craig (07867) 930265 or (0191) 2093677 Email: craigtin44@hotmail.com

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• Be wary of anyone who insists on you paying by the above methods if in doubt, get us to check them out by mailing editorial@micromart.co.uk

• Keep copies of all correspondence

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Dennis Publishing
30 Cleveland Street
London
W1T 4JD

Contact Aaron by email at:
aaron@micromart.co.uk

Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

Perfect Partitions

I am installing a new 750GB Hard Drive in my Lenovo Z580 Laptop (Windows 8 Home) ready for a Windows 10 upgrade. I intend installing Windows 7 Pro on the new Hard drive so that my Windows 10 Upgrade path would be the Pro version. My question is this:

How many partitions?

1. Install everything – OS and programs, my data – on one large partition?
2. Use two partitions, with the OS and programs on one partition and My Data on the second partition?
3. Use three Partitions, with the OS, programs, and my data, each on their own partition?

Can you also advise how large the partitions should be using a 750GB Hard drive for two and three.

My existing Windows 8 hard drive is 650GB, so I'd like to know if installing a 750 GB replacement likely to give me any issues?

Your advice would be appreciated.

Cliff

The use of partitions is largely subjective, and PC users will often have their own personal preference here; there's no real 'right' answer. However, I'm sure most would agree that having your OS on its own separate partition is always a good idea, so I'd advise against going for the one large partition option from your list.

This isolated set-up keeps your operating system separate from everything else, so programs and other data don't interfere with it. Also, should anything happens to the OS that ends up requiring you perform a format and reinstall (it happens), you can do so without worrying about what effect that will have on your data.

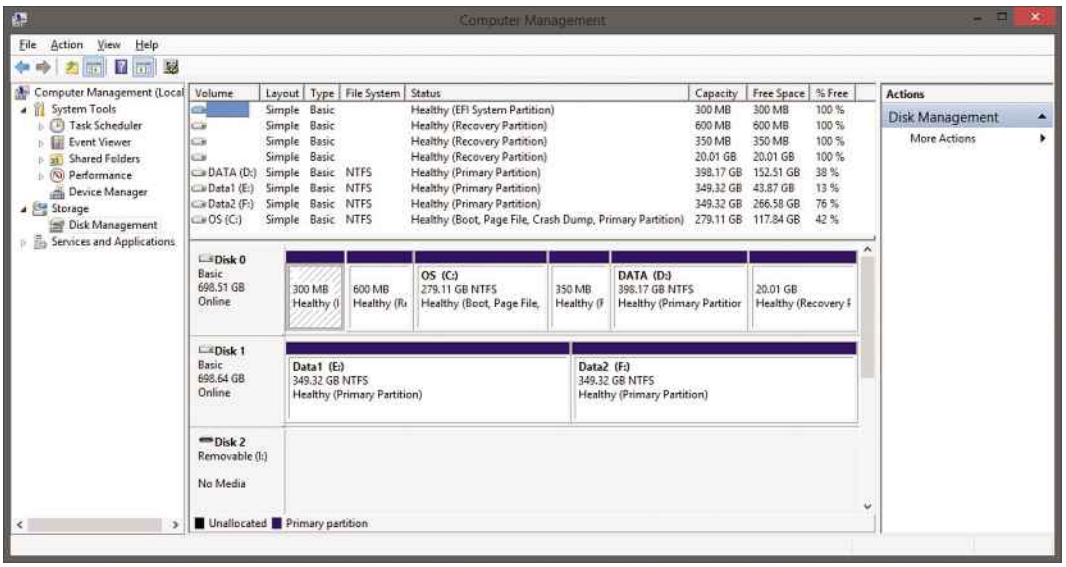
Whether you should use a further division, keeping your programs separate from your actual data, is really a matter of what you think you would prefer. When it comes to my own systems, I choose to keep data and programs separate, and use various partitions to do so, as I find this to be more suitable for my purposes. If you're a user who installs a lot of programs (which I do, due to my profession), it can be a good idea to keep things separate in this way; also potentially more secure.

> **"There's no real downside to using more partitions"**

There's no real downside to using more partitions, other than a slightly more inconvenient situation when you have to scan multiple partitions with virus scanners, etc. For my money, however, the benefits outweigh this downside, as data security is paramount.

Your upgrade to a 750GB drive shouldn't cause you any problems, so I wouldn't worry too much about that factor. In the event there are any complications, make sure that you keep the older drive handy, in case you need to return to it to get your PC operational again. Also, ensure you have your Windows key handy when you start the process. If it's an OEM copy, you may need to contact Microsoft, as you're changing hardware – but as you're buying a new version, I can't see you having anything to worry about.

Multiple partitions have many benefits, but their usefulness depends on personal preference



Insecure connection

I've encountered a problem that's preventing me from browsing websites; a problem that came to light when using Google Chrome as my browser.

Occasionally, I'll come to look around online and when I try to navigate to a website, all I'll see if a blank screen, with a note that Chrome is 'Establishing a secure connection.' Nothing else happens, and the browser simply sits there for ages, until the request eventually times out.

As far as I can tell, the issue isn't just with Chrome, however. I've also tried Internet Explorer, which also doesn't work. When this happens, which seems to do so more regularly recently, I can't get online at all. I've tried resets of the PC, but the problem remains, until magically everything just works.

I'm so confused, and don't really understand what's going on, and what I can do about it. Can you suggest anything that may help?

Joel

From the symptoms you're describing here, Joel, my first thought would be to check there isn't a problem with your actual Internet connection. The issue may actually lie with your physical connection, or with your ISP, and not with your system.

When the issue occurs, have you tried any other devices connected to your router, such as other PCs, mobile phones, or games consoles? If not, I'd check these to see if they can get online, as I suspect the issue is wider than you think.

Try power cycling your router (unplug, leave for a few seconds, and plug back in). This can solve a lot of issues, and is more than a simple dismissive cure-all. Also, if your PC or laptop is using wi-fi, try connecting it using an Ethernet cable, just in case you have some sort of problem with your wi-fi setup.

If none of this works, and you still can't get online (with others devices too) get in touch with your ISP and see if there are any known issues, or connection drops. This is quite a common cause of this kind of issue, including the status message you're getting in Chrome.

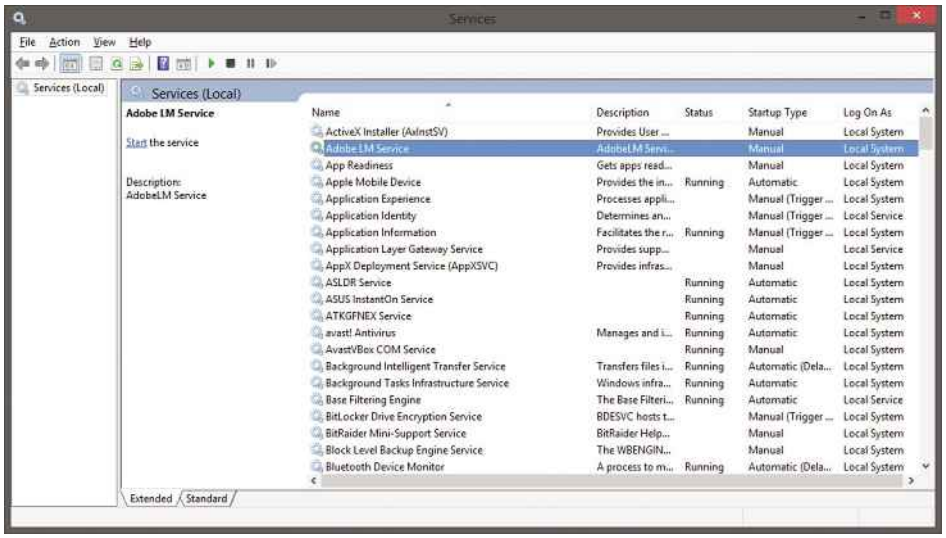
If you do all of this and the problem still remains, I'd follow up by taking a long look at your PC itself, starting with the usual antivirus and malware scans to make sure you've got no uninvited guests causing connectivity issues. Next, have a look for any programs that have been installed recently, and consider removing them one by one to see if the issue remains.

*I'd start my checking by going into Task Manager and looking in the list of installed software for anything that looks suspicious and/or you don't recognise as being installed by yourself. As always, this is made easier by using Autoruns (**bit.ly/1zJJKYU**), which provides more information on the various tasks and processes running on your system. If there's anything that looks dodgy, look into it and see about removing it. Also, make sure the task isn't set to run at startup.*

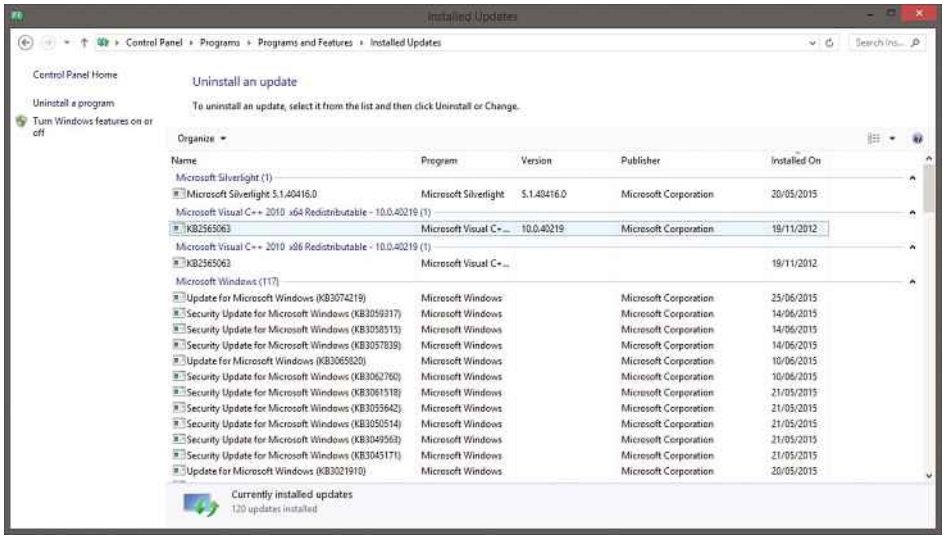
To check your running processes, press Windows+R and type 'services.msc' and then look through the list for anything you're not sure of. You can check entries online, and if you want to remove them from the equation, double-click them and disable the service. Particularly, check for services that run at startup, and try stopping them from doing so.

Next, and if you still have issues, I'd turn your attention to Windows' updates. I've read and been told that similar issues to yours can be caused by some older Windows updates, and that removing them can help, even reinstalling them could be beneficial. To do this, go to Control Panel and click to uninstall programs. Here, click the option to view installed updates and look through the list. You can uninstall updates here, so if you can remember when the issues started, consider uninstalling the update from that time. It's helped some people solve the issue, and is worth a punt.

An alternative to messing around with Windows updates manually would be to use System Restore to roll your PC back to a previous state, and this can certainly help too in quite a few circumstance. Good luck! .



Unknown and unwelcome services can be a root of various problems, so it's worth checking what's running in the background



Windows' updates have been known to cause problems, so removing troublesome ones can help correct some issues

ASK JASON

Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs

Send your questions to:
Jason D'Allison
Micro Mart
Dennis Publishing
30 Cleveland Street
London
W1T 4JD

Contact Jason by email at:
jason@micromart.co.uk

While we try to cover as many questions as we can, we regret that Jason cannot answer your questions personally, but he'll cover as many as he possibly can each week. Please ask one question per letter and remember to include the full specification of your computer, including its operating system.

Jason

Icon Believe It

I'm becoming concerned that I've not had the notification for the free upgrade to Windows 10. Everyone else I know seems to have received the little Windows icon in the system tray – they've clicked the Reserve button. I'm still waiting. I thought the upgrade was free to anyone running Windows 7 or Windows 8.x? I'm running Windows 7, and my laptop's only about four years old, so I'm a bit baffled.

Pat, Gmail

*There are several reasons why you might not see the Get Windows 10 app (as it's called). Are updates set to automatic? If not, make them so. Also, is SP1 installed? It needs to be. And for Windows 8.x users, you need to be at Windows 8.1 Update. If you're stuck at Windows 8.0 – most likely because of the CPU limitation mentioned below – you're out of luck.**

Even with everything in place, sometimes the Get Windows 10 app just doesn't appear. It can always be installed manually, though – it's just a regular update, KB3035583. You can download that – for Windows 7, in both 32-bit and 64-bit flavours – from the following thread on the Windows 7 Forums (nothing to do with Microsoft): ***goo.gl/Aua3hI****. The Windows 8.x versions of the update are available at the same site.*

Once you reserve Windows 10, Pat, nothing much happens. At some point after launch day, 29th July, the new OS will start to download and you'll get a prompt informing you it's ready to roll. That's when the fun starts. Or not!

Another reason the Get Windows 10 app can fail to appear is when the new OS simply isn't compatible with the PC's CPU. If you install the app manually, be sure to click the hamburger menu and select 'Check your PC'.† A CPU problem is rare and normally only crops up on 64-bit systems with old AMD chips or ancient motherboards. Read more at ***goo.gl/MvKRCR****. The same issue affects users trying to upgrade from Windows 8.0 to 8.1 or 8.1 Update. The only solution is to go 32-bit.*

** Even without the app, anyone running Windows 7 or 8.x is still eligible for the free Windows 10 upgrade (assuming your PC's compatible, of course). You'll just have to install it manually rather than as a downloaded update. And when I say 'anyone', I mean that Enterprise users have to pay.*

† If you're not familiar with the term, a hamburger menu is a menu coming off an icon made up of three little horizontal bars – a burger between two halves of a bun. Long favoured by Google, they're now springing up everywhere.

Hamburger, anyone?

Scrapheap Challenge?

Here's another phone query, and O2 crops up again too:

I think my PC belongs in a museum. It's an enormous grey server case fitted with a 3GHz Pentium 4 CPU, a Socket 478 motherboard, and an AGP GeForce 7600 GT graphics card. However, recently the fan on the graphics card packed up, the card overheated, and that was the end of that.

The PC now won't boot, of course, but I'm confident it'll leap back to life once a new card's fitted. Or hobble back to life, given the PC's age. I like to play games, so I need a card with some oomph, but the likes of the GeForce 7950 GT, in AGP form, sell on eBay for between £100 and £200. Why are they so expensive? What alternatives do you recommend? I'm not yet in the market for a whole new PC.

G Lees, Leicestershire

Hard-to-find components, highly sought-after by people in positions such as your own, always carry a premium. It's the way of the world – supply and demand. And the GeForce 7950 GT was the fastest AGP card ever made. They're not common, so when they come up for sale there can be a bit of a bidding war.

A 7950 GT would be a significant upgrade over your 7600 GT – it's at least 60% quicker – and by the sound of it that sort of performance isn't needed. I'm guessing the games you enjoy are as old as your PC. And there's nothing wrong with that, my friend. Not at all. However, there's an awful lot wrong with spending over £100 on an

obsolete graphics card. You'd have to be someone who barks at the moon. It's likely too, that your Pentium 4 would hold such a card back, though the 7950 GT itself is no powerhouse by today's standards.

Have you considered the GeForce 7600 GS? It's around 25% slower than the 7600 GT, but would you notice? Folks are virtually giving these cards away – you might even get change from a tenner. Naturally, you could buy another 7600 GT, but they're nearer £50 – too steep, in my view. If you really are after something beefier – perhaps your chosen games are more demanding than I've assumed – I think some tough decisions need to be made.

As I always say, there's little sense in throwing more than peanuts at a PC that's past retirement. At the drop of a hat, something else might fail, leaving you with no realistic option but to acquire a whole new rig. I'm all for keeping old kit going – I've been doing it myself for years, out of necessity – but not when it costs half as much as a brand-new, infinitely better machine.

The GeForce 7950 GT: once a monster, now barely a mouse

Beep, Beep

I took my laptop to a friend's house yesterday to do some homework. When I got there, though, it wouldn't switch on. It just issued a series of beeps. It's still the same today. As far as I know, the battery's fully charged, and anyway the laptop beeps even on the mains, with the battery removed. Is it totally kaput, do you think? It's a Dell Inspiron 15R (model N5010), about three years old.

Andy Marks, TalkTalk

I believe what you're hearing is a BIOS code, Andy. How many beeps are there before the pattern repeats? This should give a strong indication of what's amiss. A list of common BIOS codes for the Inspiron 15R can be found here: ***goo.gl/QfvS2U****.*

If I had to place a bet, I'd say you've got a RAM issue. Not a serious one – my guess is that one of the modules has simply jogged loose in transit. It's also possible that there's dust on some of the contacts. This can happen easily enough over time. The 15R BIOS code for a RAM error is either two beeps or four beeps (repeated endlessly).

Grab a small screwdriver – one of those precision jobs that come in a five-piece set from your pound shop of choice. With the laptop unplugged and the battery removed, unscrew the RAM cover on the base. It's a doddle, but if you're hesitant and worried about making a mistake, cast your peepers over the first couple of minutes of the following YouTube video: ***goo.gl/J53szV****. It shows a 15R being taken completely apart.*

Inside the hatch, unclip and remove the RAM modules – there may only be one – and clean their contacts with an eraser. Be sure to hold the modules only by the edges. Afterwards, snap them back into position, ensuring the clips are fully closed. Finally, screw the hatch on again, cross your fingers, and power the laptop back up. If that doesn't do the business for you, write back with the exact pattern of BIOS beeps, Andy, and we'll take it from there.

'Beep, beep'

Crowdfunding Corner

Sick of having to tether your phone, tablet or laptop to the wall every time you want to charge it up? This week's crowdfunding projects are both designed to give you an alternative

Nikola Labs Wireless Power Case

Wireless power sounds like a good idea, but so far no one has really come up with a way to make it as appealing as it sounds. Nikola Labs may have just changed that with its new creation: a wireless power station that 'harvests' wasted RF waves to charges your phone on the go – no dedicated charging pack required.

Designed for both iPhone 6 and Galaxy S6, the device recycles RF energy output from the phone and uses it to recharge the battery, extending the life of the device by around 30% without impacting call or data connections. As well as extending battery life, the case acts as a protector and has a stylish high-end design so you don't end up with a cheap-looking device. It's even available in five colour combinations – white, black and red as a main colour, and gold and grey as secondary ones (no red and gold, sadly).

Shipping of the device is planned for January 2016, and you can buy your hardware by backing the project for just $99 (£65), with discounts available if you order multiple units. At time of writing, the project has two weeks left to meet a $135,000 (£88,000) target, so it's not a dead cert, but it's also very likely to meet its goal. If you want one, why not help them along?

URL: kck.st/1FJMVgx
Funding Ends: Wednesday, 22nd July 2015

Solar Paper

One of the things that keeps solar chargers from taking off is that they're usually bulky and slow. Solar Paper is trying to change that, with a super-thin charger that can potentially refill an iPhone 6 as quickly as a wall charger can – roughly 2.5 hours charging time required.

As well as being relatively light (about 460g, a similar weight to an iPad), the charger has a number of special features, such as a seamless reset that makes sure it turns on and off whenever there's enough sunlight to activate the charger, and an LCD indicator that shows you how much current is being generated. The project builds on a previous solar charger, the Solarade, so this is a company that has experience of bringing a product to market through Kickstarter.

The first batch of devices will be shipping as early as September 2015, and a 5-watt model can currently be bought for $69 (£45) – well short of the retail price of $120 (£78). If you miss that, there are other quantities and other power-tiers available at higher prices, but supply of all the devices is limited, so don't wait around if you want one! At time of writing, the project is almost at its $50,000 (£32,500) goal with over a month to go, so one way or another it seems like this one's going the distance!

URL: kck.st/1RkIfbL
Funding Ends: Thursday, 20th August 2015

Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

MRI Scan Experience

We look at an app to help ease the fear of a medical procedure

To an adult, having an MRI scan can be a scary experience. The combined factors of what the MRI will find, the overwhelming sense of mortality that comes with the potential of receiving bad news, and of course there's the lying still on a bed while being moved into a claustrophobic tube. Imagine then what it's like for a child.

Thankfully I've never had to undergo an MRI scan, and (fingers crossed) I may never have to – and I wish the same to you also. While I can't, therefore, speak from experience, I imagine it to be one of those events in a person's life that could spark some of our innermost fears.

Naturally, an MRI scan isn't always a bad news event. Those brave people who have beaten the snot out of cancer, or some other, illness have regular scans to make sure that everything is okay. Receiving good news after the event must be the equivalent of winning the lottery many times over, we'd suspect.

The point is this: the procedure of receiving a letter confirming an MRI scan, through to that point where you have to lie down on the bed must be frightening, for both adults and children alike. Siemens, however, have developed an app that may help alleviate those fears.

MRI Scan Experience

The MRI Scan Experience app, available for both Android and iOS devices, has been developed by Siemens as a result of a poll that was commissioned by the company. It revealed that 63% of adults confessed that they would rather not know if there's anything wrong with them, or the reason for their symptoms. Additionally, it also revealed that 42% of those asked confessed that they wouldn't want to have an MRI scan due to being afraid of the process.

The fear stems from anxiety, claustrophobia, the length of time the scan takes and the build up to the actual scan itself – all of which I can totally understand. Siemens Healthcare, though, has taken all this on board and developed this app, through which you can experience a 360° virtual MRI scan – which includes the real sounds you'll experience – and see what it's like before you ever turn up at the hospital.

There are plenty of images, videos, information and details on how MRI works as well as information on the entire procedure from start to finish. From the point of view of the children, there are cartoon images and videos to help them relax and 'feel' what it's going to be like. For adults, there are details, facts and guidance documentation relating to the experience.

Features At A Glance

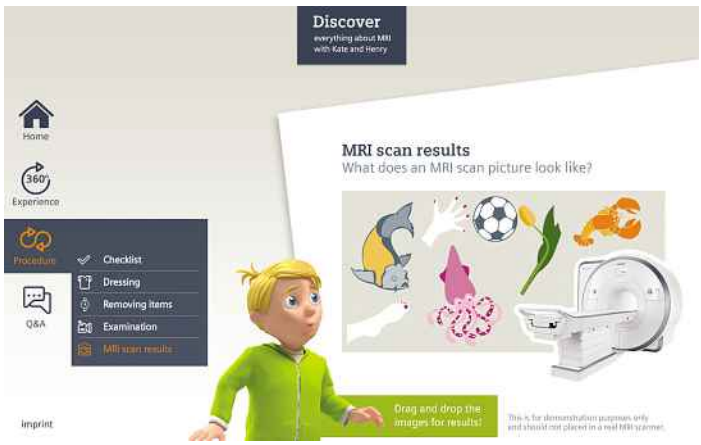
- Free
- Explanatory procedure information
- Interactive kids section
- 360-degree virtual MRI scan with realistic sounds
- Informative image gallery
- Videos of real scans and technology involved
- Results preparation section

Conclusion

Medical science is amazing, but often scary, so any help the patient can get from the already amazing work the NHS does is certainly welcome. On that front, this app is great; well designed, conceived and pitched at just the right tone for the respective audience. The level of detail it goes into is insightful, providing helpful knowledge of the procedure and, potentially even more importantly, how to prepare for it. This could be beneficial beyond words for many patients..

If you're interested in taking a look, or you know someone who may be preparing for an MRI scan, then give the app a try via the Google Play Store (**goo.gl/YmVmDt**), or iTunes (**goo.gl/W2D1t3**).

Designed for both children and adults, MRI Scan Experience can help take some of the anxiety of a scan away



it's full of useful and relevant information

Logging Off

With the arrival of Windows 10 just weeks away, already the wind speed has noticeably increased ahead of this impending technological storm. But having lived through a few upgrade hurricanes myself, what's interesting me most is the entirely weird collateral effects that its rapid approach can create.

For example, in the past month, Microsoft's bestselling version of Windows isn't 8.1 or 8.0. No, it's Windows 7, which now has an impressive 61% of all installations.

What's driving this is that Microsoft has already told us that to Windows 7 and 8.x customers, Windows 10 will be free. And therefore, logically, if you want a cheap copy of Windows 10, then an OEM version of Windows 7 is your best bet.

It's a solid plan from numerous perspectives, because if it goes horribly wrong, and Windows 10 plummets to the ground like a structurally unsound early aviation experiment, you've still got a copy of good old Windows 7. And given the track record of the company involved, some tactical planning is probably in order for all eventualities.

As Windows 7 was, possibly temporarily, making itself king of Windows, the number of Windows 8.x users has actually declined to 16%, a truly abysmal number for nearly four years and a major mid-term upgrade.

Perhaps it's rubber-necking on my part, but I'd like Microsoft to come clean after Windows 10 launches about how badly Windows 8 sold. But it won't because then it would have to explain how it generally bandied about the number of 20 million new licences a month, which doesn't add up to the total number now in a year, not four of them.

As they say, it's all about managing expectations.

And talking of that, on July 29th we'll all have Windows 10, like Microsoft promised, yes?

Whoa, hold on their, Tex! Yes, Microsoft very clearly said, or rather Terry Myerson on its behalf, that "On July 29, you can get Windows 10 for PCs and tablets by taking advantage of the free upgrade offer, or on a new Windows 10 PC from your favourite retailer."

But now Terry's now issued another contradictory statement in which he's saying "Starting on July 29, we will start rolling out Windows 10 to our Windows Insiders." Eh?

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PUBLISHED BY
Dennis Publishing
30 Cleveland Street
London
W1T 4JD
Tel: 0207 907 6000
www.dennis.co.uk

PRINTING
Printed By: BGP
Distributed By: Seymour

Certified Distribution:
13,712 average copies
Jan-Dec 2010

Those aren't close to being the same thing, and Microsoft seems to have blown off July 29th as being the Windows 10 epoch day for the majority of those who are expecting to see it then.

My advice to Microsoft would be if you'd like a little credibility, much needed if we're being brutally honest, then don't make big public statements one month and then subtly scupper them a few weeks later.

I'm sure on that day some people will have it, but others won't, possibly because Microsoft is concerned that there might be something horrible in there, and if that's the case then it would like to annoy only a small portion of its customers, not the bulk of them. That makes sense. More than making showboat statements that in a depressively short period it would come to regret issuing.

Truth and the tech industry are rarely cosy bedfellows, but some companies have real issues with it, and Microsoft is one of those.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: **1** Copy, **3** Promises, **9** Physics, **10** Ultra, **11** Civilization, **13** Thirty, **15** Avesta, **17** Homeomorphic, **20** Capri, **21** Task Bar, **22** Monopoly, **23** Stat.
Down: **1** Capacity, **2** Pay TV, **4** Resize, **5** Mount Everest, **6** Sitcoms, **7** SOAP, **8** Will-O'-The-Wisp, **12** Baccarat, **14** Isospin, **16** Amatol, **18** Habit, **19** Scam.

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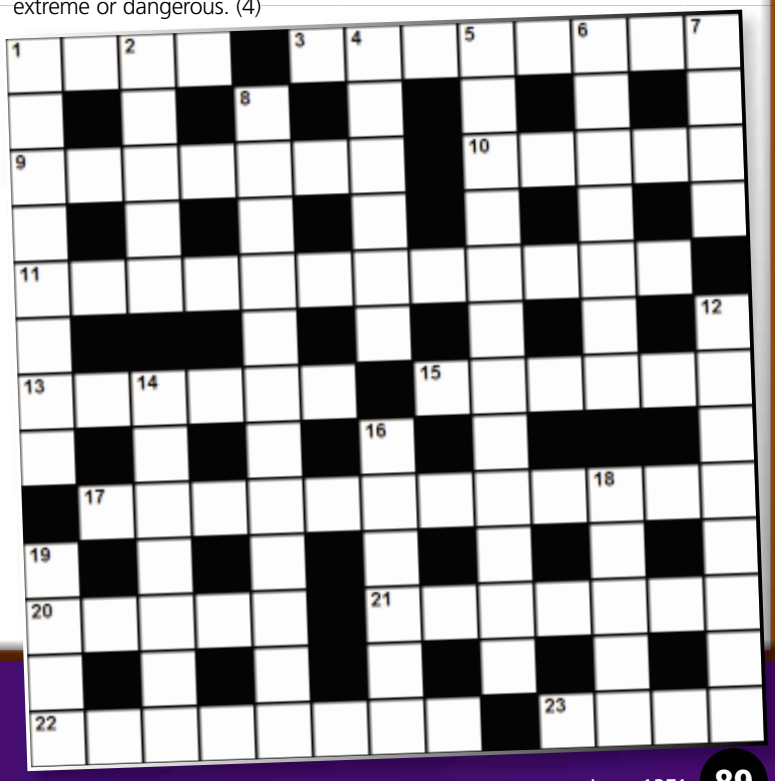
This week, we suffered a bit of beer and tea related amnesia (not in work hours, of course). Having boiled the kettle, put a teabag in a mug and poured in hot water, we then went to the fridge for the milk. But then, at the back of the fridge, we spotted a beer. A nice cold beer, just sitting there, looking all nice and cold. The sun was out, we didn't have to go anywhere and it was only one beer. One lovely, beautiful bottle of beer, calling out to us. Instinctly, we took this drink out of the fridge, feeling the soothing chill of the glass as we held it one hand and opened it with a bottle opener with the other hand. We then proceeded to drink the beverage within, and we felt good. In that moment, everything made sense. Also, it was yummy. But just as we were draining the last of this golden liquid from its vessel, we noticed a rather sad-looking, overbrewed cup of black tea sitting by the kettle. Where did that come from, we wondered. And then we remembered. Poor tea. Poor forgotten tea, with its cold, soggy teabag floating in a cup of pure, lukewarm disappointment. We felt bad. Still, that beer was good. What were we talking about again?

THIS WEEK'S CROSSWORD

Across
1 At the highest point of development especially in judgment or knowledge. (4)
3 A substance formed from two or more elements chemically united in fixed proportions. (8)
9 Italian physiologist noted for his discovery that frogs' muscles contracted in an electric field – this led to the galvanic cell. (1737-1798) (7)
10 A stateful firewall built on the Linux netfilter framework. (5)
11 A comprehensive appraisal of a business undertaken by a prospective buyer to establish its assets and liabilities and evaluate its commercial potential. (3,9)
13 Any of the older gods who preceded the Olympians and were the children of Uranus and Gaia. (6)
15 A cry of joy or satisfaction when one finds or discovers something. (6)
17 UK government securities that offer no interest or capital gain but are entered into regular draws for cash prizes. (7,5)
20 An unbounded two-dimensional shape. (5)
21 .ma TLD. (7)
22 An alphabetical list of technical terms in some specialised field of knowledge. (8)
23 A philosophical or political group, especially one regarded as extreme or dangerous. (4)

Down
1 The physical property of being stiff and resisting bending. (8)
2 A single vibration or short burst of sound, electric current, light or other wave. (5)
4 The point of intersection of coordinate axes. (6)
5 Integers that have no integral factors but theirself and 1. (5,7)
6 Repurpose waste materials into new materials or products of higher quality and greater use. (7)
7 Trick or swindle someone. (4)
8 Figures regarded as significant in a particular context – atomic physics for example. (5,7)
12 A document issued by a country to a citizen allowing that person to travel abroad and re-enter the home country. (8)
14 A destructive vortex of violently rotating wind with a funnel-shaped cloud. (7)
16 The warmest season of the year, in the northern hemisphere from June to August and in the southern hemisphere from December to February. (6)
18 A specialised but profitable segment of the market. (5)
19 A popular format for compressing digital images. (Abbr) (4)



In Next Week's Micro Mart*

- Hands on with Intel's latest processors
- 15 of the best photo editors available
- How smart wearables can be both cheap and fun
- The 10 best VR demos and apps
- Plus the usual mix of news, reviews and advice

* May be subject to change

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